Honey Plants

Medonosne biljke



MUSAE

MUSAE is a Horizon Europe project pioneering a new approach to digital transformation by integrating Design Futures and Art Thinking to help businesses innovate with emerging technologies. By bridging art, design, and technology, MUSAE empowers SMEs, mid-caps, and public sector organizations across the EU to envision future scenarios and create cutting-edge solutions, to accelerate the digital and green transformation.

At its core, MUSAE is driven by a Planet-Centered Factory Model, designed to guide digital innovation in the food domain, enhancing human well-being and sustainable impact. As part of the S+T+ARTS ecosystem, MUSAE fosters art-tech collaborations that unlock new market opportunities and future-driven innovations.

S+T+ARTS
SCIENCE + TECHNOLOGY + ARTS

European Commission

MUSAE

MUSAE je projekat programa *Horizon Europe* koji je pionir u novom pristupu digitalnoj transformaciji integrišući *Design Futures* i *Art Thinking* kako bi pomogao preduzećima da inoviraju sa novim tehnologijama. Premošćujući umetnost, dizajn i tehnologiju, *MUSAE* osnažuje mala i srednja preduzeća, preduzeća srednje kapitalizacije i organizacije javnog sektora širom EU da zamisle buduće scenarije i stvore najsavremenija rešenja, kako bi ubrzali digitalnu i zelenu transformaciju.

MUSAE se zasniva na modelu fabrike usmerenom na planetu, osmišljenom da vodi digitalne inovacije u oblasti hrane, poboljšavajući ljudsko blagostanje i održivi uticaj. Kao deo *S+T+ARTS* ekosistema, *MUSAE* podstiče saradnje između umetnosti i tehnologije koje otvaraju nove tržišne mogućnosti i inovacije usmerene na budućnost.

S+T+ARTS
SCIENCE + TECHNOLOGY + ARTS

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Bee-Sustain – AI Meets Beekeeping for Biodiversity

Bee-Sustain is an innovative project that bridges technology, ecology, and art to support sustainable beekeeping and biodiversity. Developed through the MUSAE art-tech residency, the project responds to the decline in pollinators by empowering beekeepers with tools to adapt to climate change, optimize honey production, and contribute to environmental health. Bee-Sustain also invites citizens to engage in ecological monitoring, fostering a wider sense of shared responsibility for biodiversity.

The Bee-Sustain prototype integrates custom-built IoT hive devices and microclimatic sensors that collect real-time data on hive conditions and environmental factors such as temperature, humidity, CO_2, and air quality. This data feeds into an AI system trained on over 120,000 datapoints, which predicts nectar flow and recommends optimal hive placement. These insights are delivered through a mobile app with a user-friendly interface.

Alongside the technology, an interactive Art Book transforms data into visual narratives, making scientific insights accessible and engaging. The Art Book includes pressed plants, dynamic visualizations, and location-based environmental records, creating a living document of biodiversity. Bee-Sustain thus merges precision beekeeping practice with creative storytelling to inspire a new era of ecological stewardship.

QRcode
to downloadthe app

BEE SUSTAIN

Bee-Sustain – Veštačka inteligencija pomaže održivom pčelarstvu i biodiverzitetu

Bee-Sustain je inovativni projekat koji povezuje tehnologiju, ekologiju i umetnost kako bi podržao održivo pčelarstvo i biodiverzitet. Razvijen kroz umetničko-tehnološku rezidenciju *MUSAE*, projekat odgovara na pad broja oprašivača osnaživanjem pčelarima alatima za prilagođavanje klimatskim promenama, optimizaciju proizvodnje meda i doprinos zdravlju životne sredine. *Bee-Sustai*n takođe poziva građane da se uključe u ekološko praćenje, podstičući širi osećaj zajedničke odgovornosti za biodiverzitet.

Prototip *Bee-Sustain* integriše prilagođene *IoT* uređaje za košnice i mikroklimatske senzore koji prikupljaju podatke u realnom vremenu o uslovima u košnicama i faktorima životne sredine kao što su temperatura, vlažnost, CO_2 i kvalitet vazduha. Ovi podaci se unose u sistem veštačke inteligencije obučen na preko 120.000 tačaka podataka, koji predviđa protok nektara i preporučuje optimalno postavljanje košnica. Ovi uvidi se pružaju putem mobilne aplikacije sa korisničkim interfejsom.

Uz tehnologiju, interaktivna umetnička knjiga H*oney Plants – Medonosne biljke* transformiše podatke u vizuelne narative, čineći naučne uvide pristupačnim i zanimljivim. Umetnička knjiga uključuje presovane biljke, dinamičke vizuelizacije i ekološke zapise zasnovane na lokaciji, stvarajući živi dokument biodiverziteta. Bee-Sustain tako spaja preciznu pčelarsku praksu sa kreativnim pripovedanjem kako bi inspirisao novu eru ekološkog upravljanja.

QR kod za preuzimanje aplikacije

Chapter One

HERBARIUM

Herbarium of Honey Plants

The Herbarium contains ninety honey plants from the territory of the Republic of Serbia. They are arranged chronologically, by flowering time, and provide information on the amount of nectar and pollen.

Nectar is a sweet liquid produced by flowers to attract pollinators, such as bees. It is rich in sugars and is the main source of energy for bees, which use it for food and honey production. While collecting nectar, bees transfer pollen from one flower to another, which enables the pollination and reproduction of plants and plays a key role in the preservation of plant life and the entire ecosystem.

Pollen is a fine powder found in the anthers of flowers and represents the male gametes of plants. For bees, pollen is the main source of protein, vitamins and minerals necessary for growth and development, especially for feeding the larvae in the hive. The bees collect it in clumps on their hind legs and carry it to the hive. As they fly from flower to flower, some of the pollen remains on other plants, which enables pollination and plant reproduction.

Based on the Herbarium, users can identify honey plants in their environment or cultivate them themselves to contribute to the bee community and honey income, as well as a more diverse biodiversity.

Further information on each plant can be obtained by scanning the QR codes which take the user to the website of the Royal Botanic Gardens, Kew. Kew Gardens is one of the most famous botanical gardens in the world, located in southwest London. It was founded in 1759 and today is an international center for the study of plants, preservation of biodiversity and education about plants and the environment.

Herbarijum Medonosnih Biljaka

Herbarijum sadrži devedeset medonosnih biljaka sa teritorije Republike Srbije. Poređane su hronološki, po vremenu cvetanja, i pružaju informacije o količini nektara i polena.

Nektar je slatka tečnost koju proizvode cvetovi kako bi privukli oprašivače, poput pčela. Bogat je šećerima i predstavlja glavni izvor energije za pčele, koje ga koriste za ishranu i proizvodnju meda. Dok skupljaju nektar, pčele prenose polen s jednog cveta na drugi, čime omogućavaju oprašivanje i razmnožavanje biljaka i imaju ključnu ulogu u očuvanju biljnog sveta i celokupnog ekosistema.

Polen je sitni prah koji se nalazi u prašnicima cvetova i predstavlja muške polne ćelije biljaka. Za pčele, polen je glavni izvor proteina, vitamina i minerala neophodnih za rast i razvoj, posebno za ishranu larvi u košnici. Pčele ga skupljaju u grudvice na zadnjim nogama i prenose u košnicu. Dok lete s cveta na cvet, deo polena ostaje na drugim biljkama, što omogućava oprašivanje i razmnožavanje biljaka.

Na osnovu Herbarijuma korisnici mogu da identifikuju medonosne biljke u svojoj okolini ili da ih sami kultivišu kako bi doprineli pčelinjoj zajednici i medonosnom prihodu, kao i raznovrsnijem biodiverzitetu.

Dodatne informacije o svakoj biljci se mogu dobiti skeniranjem QR kodova koji korisnika vode na sajt Royal Botanic Gardens, Kew. Kew Gardens je jedan od najpoznatijih botaničkih vrtova na svetu, smešten u jugozapadnom Londonu. Osnovan je 1759. godine i danas predstavlja međunarodni centar za proučavanje biljaka, očuvanje biodiverziteta i edukaciju o biljkama i životnoj sredini.

Galanthus Nivalis

Visibaba / *Snowdrop*

Vreme cvetanja / Flowering Time:

Jan/Feb/Mar/Apr

Nektar / Nectar: 1

Polen / Pollen: 1



Visibaba (eng. Snowdrop)

Višegodišnja zeljasta biljka sa jednim belim cvetom na vrhu u obliku zvona. Cveta posle snega ili se probija kroz njega. Može da dosegne visinu između 10 i 30 cm.

A perennial herb with a single white bell-shaped flower on top. It blooms after the snow or breaks through it. It can reach a height between 10 and 30 cm.

Corylus Avellana

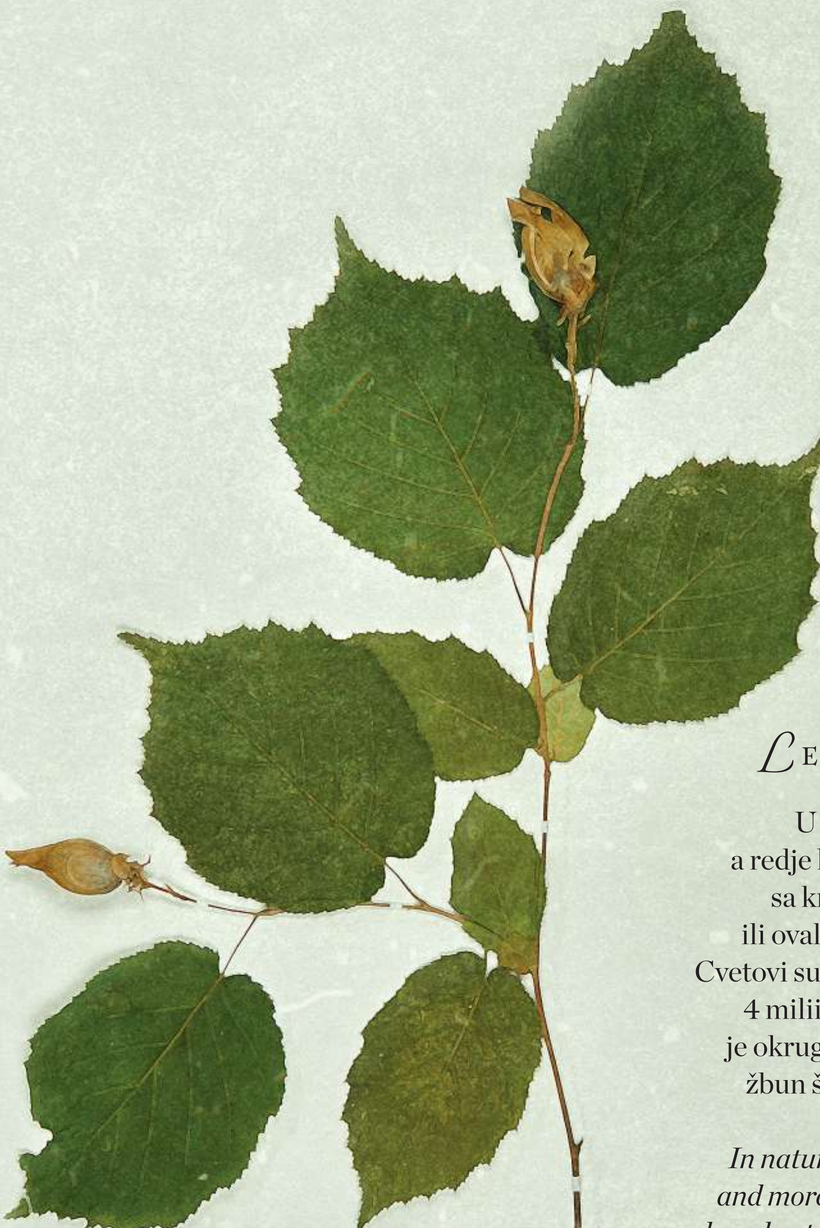
Lešnik / Hazel

Vreme cvetanja / Flowering Time:

Jan/Feb/Mar/Apr

Nektar / Nectar: 0

Polen / Pollen: 4



Lešnik (eng. Hazel)

U prirodi se sreće kao žbun do 7 m, a redje kao drvo visine do 10. Ima listove sa kratkom drškom koji su okruglasti ili ovalni a po obodu testerasti i dlakavi. Cvetovi su u vidu reska i jedna resa ima oko 4 miliiona polenovih zrna. Plod lešnika je okrugao ili jajasti. Gaji se i kao ukrasni žbun što je pčelama od velikog značaja.

In nature, it is found as a shrub up to 7 m, and more rarely as a tree up to 10 m tall. It has short-stemmed leaves that are round or oval and saw-toothed and hairy around the edges. The flowers are in the form of spikes and one spike has about 4 million pollen grains. Hazelnut fruit is round or ovoid. It is also grown as an ornamental shrub, which is of great importance to bees.

Cornus Mas

Dren / Cornel

Vreme cvetanja / Flowering Time:

Feb/Mar

Nektar / Nectar: 1

Polen / Pollen: 3



Dren (eng. Cornel)

Dren se u prirodi sreće kao žbun ili drvo visine do 8 m sa krošnjom zaobljenom na vrhu. Listovi su naspramni, jajasti sa dugačko izvučenim vrhovima. Cvetovi su četvoročlani, sitni i žuti i javljaju se rano pre listanja sakupljeni u štitastoj cvasti. Plod je crvena elepsoidna viseća koštunica.

Dogwood is found in nature as a shrub or tree up to 8 m tall with a crown rounded at the top. The leaves are opposite, ovate with long elongated tips. The flowers are four-parted, small and yellow and appear early before leafing, collected in a shield inflorescence. The fruit is a red ellipsoid drupe.

Bellis Perennis

Bela rada / Daisy

Vreme cvetanja / Flowering Time:

Mar/Apr/May/Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 1

Polen / Pollen: 1

Bela rada (eng. Daisy)



Višegodišnja zeljasta biljka sa kratkom stabljikom i duguljastim lišćem. Središni cvetovi su žuti, cevasti, a obodni jezičasti, beli, na vrhu često ružičasti ili crveni.

A perennial herb with a short stem and oblong leaves. The central flowers are yellow, tubular, and the peripheral flowers are tongue-shaped, white, often pink or red at the top.



Veronica Persica

Mišljakinja / Birdeye Speedwell

Vreme cvetanja / Flowering Time:

Mar/Apr/May/Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 1



Mišljakinja (eng. Birdeye Speedwell)



Jednogodišnja ili dvogodišnja zeljasta biljka sa slabom, tankom i okruglom stabljikom koja je polegla ili se izdiže, visine između 10 i 40 cm. Donji listovi su jajasti, šiljati i kratko ušiljeni i sa kraćim drškama. Gornji listovi su jajasti ili eliptični, često veći od donjih. Cvetovi su plavi i sitni, pojedinačni i dugim drškama.

An annual or biennial herb with a weak, thin and round stem that is prostrate or erect, between 10 and 40 cm tall. The lower leaves are ovate, pointed and shortly acuminate and with shorter petioles. The upper leaves are ovate or elliptic, often larger than the lower ones. The flowers are blue and small, single and with long stalks.

Lamium Purpureum

Crvena mrtva kopriva /

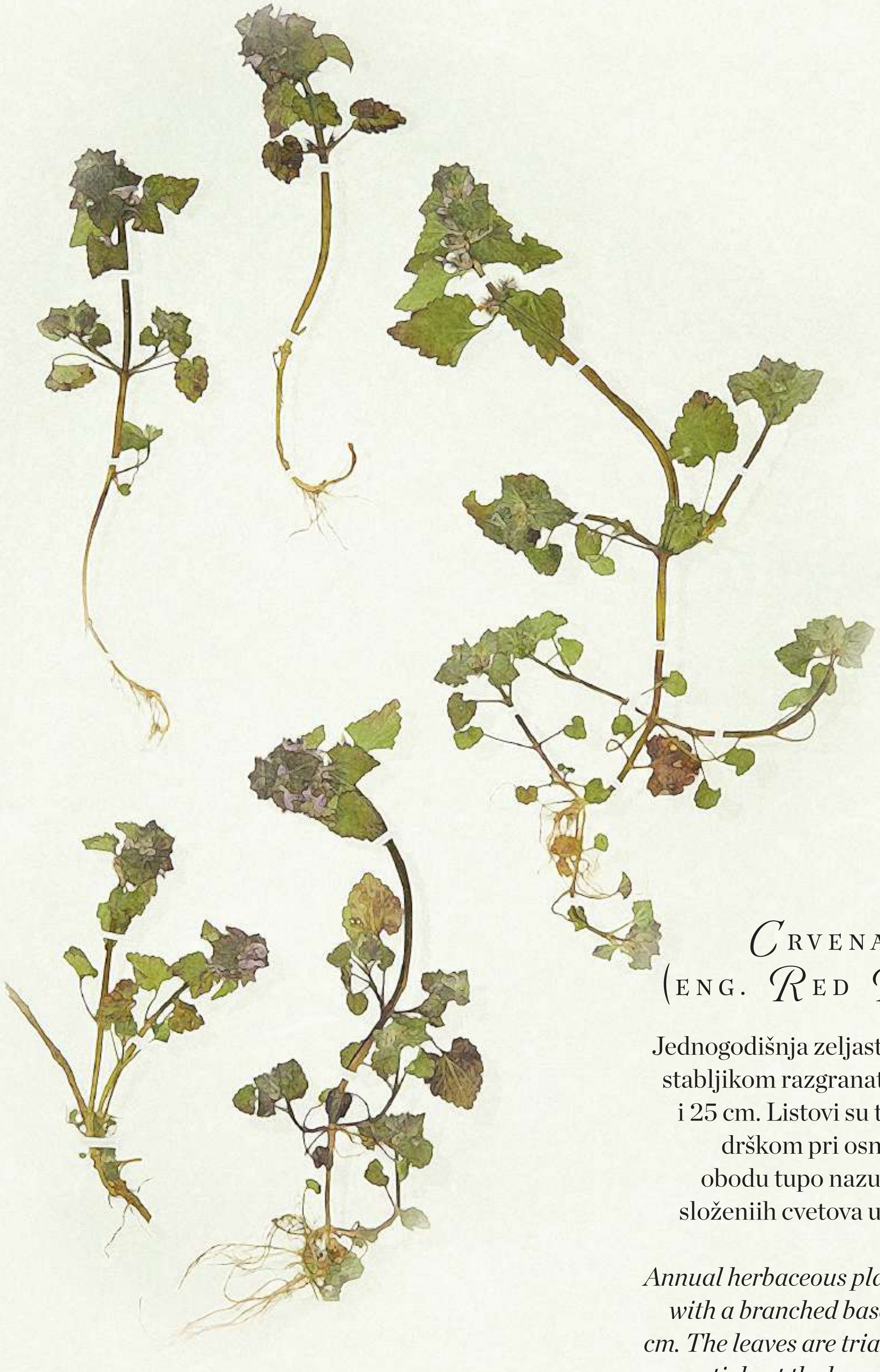
/ Red Dead-Nettle

Vreme cvetanja / Flowering Time:

Mar/Apr/May/Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 3

Polen / Pollen: 3



Crvena mrtva kopriva (eng. Red Dead-Nettle)

Jednogodišnja zeljasta biljka sa nežnom tankom stabljikom razgranate osnove, visine između 10 i 25 cm. Listovi su trouglasto jajasti sa kraćom drškom pri osnovi, a vrh je kratko šiljat po obodu tupo nazubljen i dlakavi. Ima 6 do 10 složeniih cvetova u 3 do 7 pividnih pršljenova.

Annual herbaceous plant with a delicate thin stem with a branched base, height between 10 and 25 cm. The leaves are triangular-ovate with a shorter petiole at the base, and the tip is short-pointed around the edge, bluntly toothed and hairy. There are 6 to 10 compound flowers in 3 to 7 pivid whorls.

Hyacinthus Orientalis

Zumbul / Hyacinth

Vreme cvetanja / Flowering Time:

Mar/Apr

Nektar / Nectar: 3

Polen / Pollen: 2

Zumbul (eng. Hyacinth)

Višegodišnja ukrasna biljka sa cvetnom, okruglom, debelom i uspravnom stabljikom visine između 20 i 30 cm. Listovi su brojni, široko linearni a na vrhu zatupasti, mesnati, ravni ili užlebljeni. Cvetovi različite boje stoje vodoravno ili više cvetova obrazuju grozdastu cvast koja može biti jajasta, valjkasta, rastresita ili zbijena.

Perennial ornamental plant with a flowering, round, thick and upright stem between 20 and 30 cm high. The leaves are numerous, broadly linear and obtuse at the top, fleshy, flat or grooved. Flowers of different colors stand horizontally or several flowers form a clustered inflorescence that can be ovoid, cylindrical, loose or compact.



Prunus Spinosa

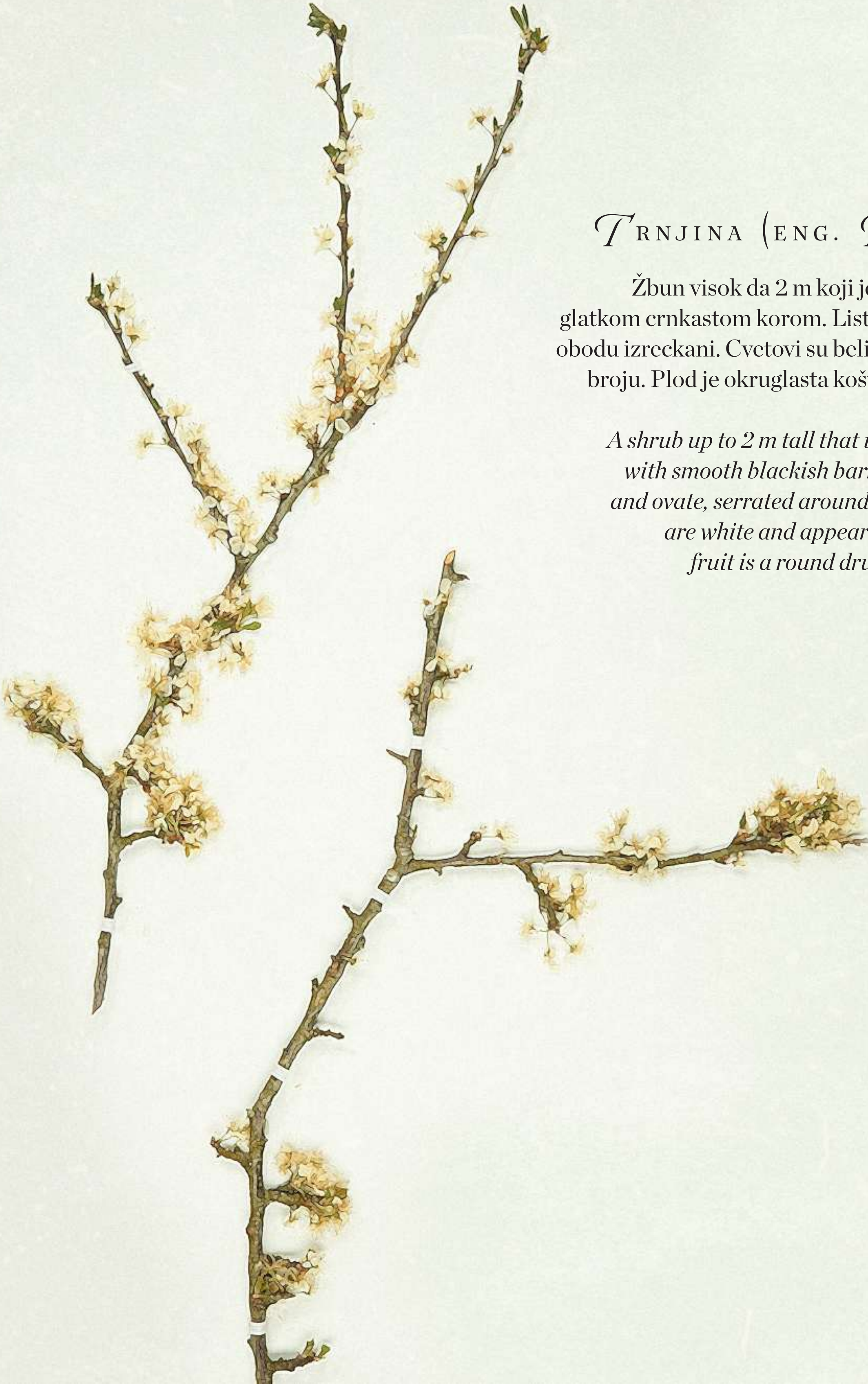
Trnjina / Blackthorn

Vreme cvetanja / **Flowering Time:**

Mar/Apr

Nektar / **Nectar:** 3

Polen / **Pollen:** 2



Trnjina (eng. Blackthorn)

Žbun visok da 2 m koji je trnovit i razgranat sa glatkom crnkastom korom. Listovi su sitni i jajasti, po obodu izreckani. Cvetovi su beli i javljaju se u velikom broju. Plod je okruglasta koštunica plavocrne boje.

A shrub up to 2 m tall that is thorny and branched with smooth blackish bark. The leaves are small and ovate, serrated around the edges. The flowers are white and appear in large numbers. The fruit is a round drupe of blue-black color.

Prunus Armeniaca

Kajsija / Apricot

Vreme cvetanja / Flowering Time:

Mar/Apr

Nektar / Nectar: 3

Polen / Pollen: 3



Kajsija (eng. Apricot)

Dugovečna voćka sa razgranatom krošnjom sa ogruglim listovima koji su na vrhu zašiljeni. Cveta rana, a plodovi kajsije su narandžaste boje.

A long-lived fruit tree with a branched crown with rounded leaves that are pointed at the top. The rana blossoms, and the apricot fruits are orange in color.

Prunus Cerasifera

Džanarika / Cherry Plum

Vreme cvetanja / Flowering Time:

Mar/Apr/May

Nektar / Nectar: 4

Polen / Pollen: 4



Džanarika (eng. Cherry Plum)

Drvo visoko do 8 m, razgranato i sreće se u poližbunastom obliku sa više stabala. Listovi su lancetasti i po obodu sitno nazubljeni. Cvetovi su beli i mnogobrojni.

A tree up to 8 m high, branched and found in a polyshrub form with several trees. The leaves are lanceolate and finely serrated around the edge. The flowers are white and numerous.

Taraxacum Officinale

Maslačak / Dandelion

Vreme cvetanja / Flowering Time:

Mar/Apr/May/Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 3

Polen / Pollen: 4

Maslačak (eng. Dandelion)

Višegodišnja zeljasta biljka sa cevastom šupljom stabljikom visine do 50 cm. Listovi su oblojajasti do usko lancetasti, najčešće duboko testerasto usečeni sa trouglastim vrhovima. Na vrhu stabljike je zlatnožut glavičast cvast od 100 do 200 jezičastih cvetova. Kada opadnu cvetni listići stvara se balon od belog perja.

A perennial herbaceous plant with a tubular hollow stem up to 50 cm high. The leaves are obovate to narrowly lanceolate, usually deeply saw-cut with triangular tips. At the top of the stem is a golden-yellow inflorescence of 100 to 200 tongue-shaped flowers. When the flower petals fall, a balloon of white feathers is created.



Senecio Vulgaris

*D*RAGUŠAC / *G*ROUNDSEL

Vreme cvetanja / **Flowering Time:**

Mar/Apr/May/Jun/Jul/Aug/Sep/Oct

Nektar / **Nectar:** 3

Polen / **Pollen:** 4



Dragušac (eng. Groundsel)

Jednogodišnja, ređe dvogodišnja, zeljasta biljka sa uspravnom i razgranatom stabljikom visine do 60 cm. Listovi su izduženo eliptični, duboko i nejednako usečeni. Cvetovi su žuti i sakupljeni u glavičaste cvasti.

Annual, rarely biennial, herbaceous plant with an upright and branched stem up to 60 cm high. The leaves are elongated elliptic, deeply and unequally cut. The flowers are yellow and are collected in inflorescences.

Rosmarinus Officinalis

Ruzmarin / Rosemary

Vreme cvetanja / Flowering Time:

Mar/Apr/Oct/Nov

Nektar / Nectar: 3

Polen / Pollen: 1



Ruzmarin (eng. Rosemary)

Višegodišnji zimzeleni žbun visine do 3 m. Listovi su naspramni, linearni, zadebljani, sedeći i aromatični. Cvetovi su svetloplavi ili beli sakupljeni u grupicama po 5 do 10
.

Perennial evergreen shrub up to 3 m tall. The leaves are opposite, linear, thickened, sessile and aromatic. The flowers are light blue or white collected in clusters of 5 to 10.

Viola Odorata

Ljubičica / Violet

Vreme cvetanja / Flowering Time:

Mar/Apr

Nektar / Nectar: 1

Polen / Pollen: 1





Ljubičica (eng. Violet)

Višegodišnja zeljasta biljka visine do 10 cm. Listovi su srcasti i plitko nazubljeni. Iz stabljike izrastaju vreže koe se na više mesta ožile i ukorene i na ovaj način se razmnožava. Cvetovi su pojedinačni na dugim drškama svetlo ili tamno ljubičasti.

Perennial herbaceous plant up to 10 cm tall. The leaves are heart-shaped and shallowly toothed. Bushes grow from the stem, which are scarred and rooted in several places, and this is how it reproduces. The flowers are single on long stems, light or dark purple.

Brassica Pekinensis

Perko / Napa Cabbage

Vreme cvetanja / Flowering Time:

Apr

Nektar / Nectar: 3

Polen / Pollen: 4



Perko (eng. Napa Cabbage)

Jednogodišnja zeljasta krmna biljka. Stabljika je gola, uspravna, jaka, sočna i slabo razgranata. Listovi su široki, naborani, velike površine sa beličastim glavnim nervom i sa nazubljenim rubovima. Cvetovi su zlatnožuti.

Annual herbaceous forage plant. The stem is bare, upright, strong, juicy and weakly branched. The leaves are wide, wrinkled, large surfaces with a whitish main vein and serrated edges. The flowers are golden yellow.

Prunus Cerasus

Višnja / Sour Cherry

Vreme cvetanja / Flowering Time:

Apr

Nektar / Nectar: 4

Polen / Pollen: 3



Višnja (eng. Sour Cherry)

Listovi su jajoliku, zašiljeni i po obodu nazubljeni. Cvetovi su beli na dugim peteljkama.

The leaves are ovate, pointed and toothed around the edges. The flowers are white on long stems.

Prunus Avium

Trešnja / Sweet Cherry

Vreme cvetanja / Flowering Time:

Apr/May

Nektar / Nectar: 3

Polen / Pollen: 3





Trešnja (eng. Sweet Cherry)

List je eliptičan, na vrhu zašiljen, po obodu nazubljen i na kratkoj je dršci. Cvetovi su beli, na dugim peteljkama, sakupljeni po desetak u gronjastim cvastima.

The leaf is elliptic, pointed at the top, serrated around the edge and on a short stem. The flowers are white, on long stalks, collected by ten in clusters.

Salvia Officinalis

Žalfija / Sage

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul

Nektar / Nectar: 4

Polen / Pollen: 4

Žalfija (eng. Sage)

Višegodišnja biljka visine 50 do 80 cm. Stablo je četvrtasto, uspravno sa mnogobrojnim olistalim granama, rasparnim, sa dlacicama. Listovi su naspramni, ozubljeni, duguljasti ili lancetasti, dlakavi, odozgo zeleni a odozdo srebrnastobeli. Ima 5 do 10 cvetova u pazuhama listova na gornjim pršljenovima. Krunica je ljubičato plava, roze ili bela, cevasto dvousna.

Perennial plant 50 to 80 cm tall. The trunk is square, upright with numerous leafy branches, split, with hairs. The leaves are opposite, toothed, oblong or lanceolate, hairy, green above and silver-white below. There are 5 to 10 flowers in the axils of the leaves on the upper whorls. The corolla is violet blue, pink or white, tubular with two lips.



Juglans Regia

Orah / *Walnut*

Vreme cvetanja / Flowering Time:

Apr/May

Nektar / Nectar: 0

Polen / Pollen: 4



Orah (eng. Walnut)

Drvo sa širokom ovalnom ili okruglastom krošnjom i jakim glavnim granama visine do 30 m. Listovi su na dugim i jakim peteljkama, neparno perasti, obično sa 5 do 9 listića koji su eliptični, sjajno zeleni, celog oboda i zašiljeni. Muški cvetovi su žućkastozeleni, sakupljeni u debelim i dugim visećim resama i pojavljuju se na prošlogodišnjim granama. Ženski cvetovi su peharastog oblika, nalaze se na ovogodišnjim zelenim granama i liče na pupoljke.

A tree with a wide oval or round crown and strong main branches up to 30 m high. The leaves are on long and strong petioles, oddly pinnate, usually with 5 to 9 leaflets that are elliptic, bright green, entire rim and pointed. Male flowers are yellowish green, collected in thick and long hanging fringes and appear on last year's branches. Female flowers are cup-shaped, located on this year's green branches and look like buds.

Malus Domestica

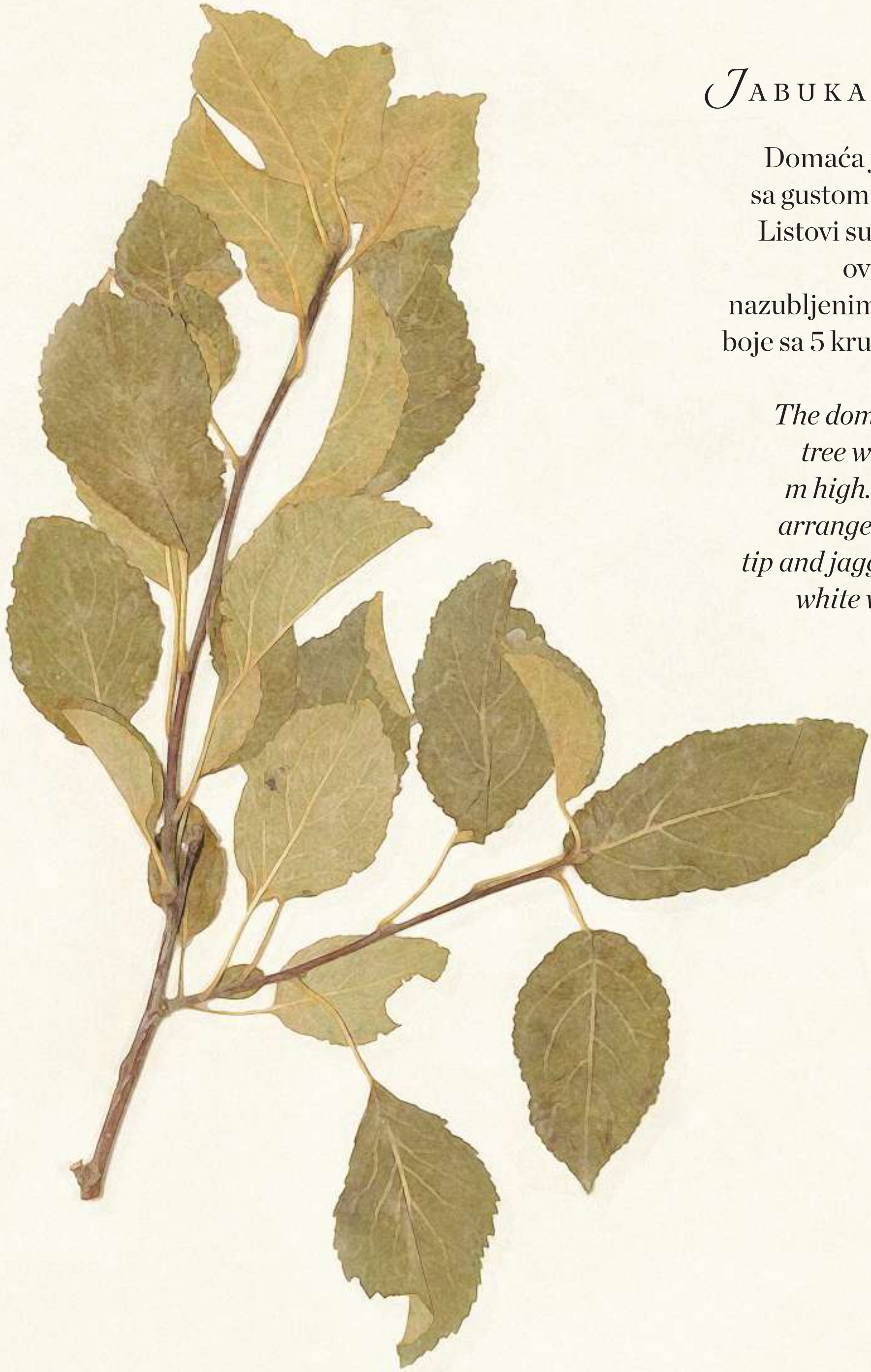
Jabuka / Apple

Vreme cvetanja / Flowering Time:

Apr

Nektar / Nectar: 3

Polen / Pollen: 3



Jabuka (eng. Apple)

Domaća jabuka je listopadno drvo
sa gustom krošnjom visine do 12 m.
Listovi su naspramno raspoređeni,
ovalni sa izraženim vrhom i
nazubljenim ivicama. Cvetovi su bele
boje sa 5 kruničnih i 5 čašičnih listića.

*The domestic apple is a deciduous
tree with a dense crown up to 12
m high. The leaves are oppositely
arranged, oval with a pronounced
tip and jagged edges. The flowers are
white with 5 petals and 5 sepals.*

Pirus Domestica

Kruška / Pear

Vreme cvetanja / Flowering Time:

Apr

Nektar / Nectar: 1

Polen / Pollen: 2




Kruška (eng. Pear)

Voćka sa velikom i gustom krošnjom. Listovi su okruglastojajasti na dugim peteljkama, zašiljeni i sitno nazubljeni. Cvetovi su beli, po nekoliko u gornjastim cvastima, pojavljuju se istovremeno sa listovima.

A fruit tree with a large and dense crown. The leaves are round-shaped on long petioles, pointed and finely toothed. The flowers are white, several in the upper inflorescences, appearing at the same time as the leaves.

Cydonia Oblonga

Dunja / Quince

Vreme cvetanja / Flowering Time:

Apr/May

Nektar / Nectar: 2

Polen / Pollen: 3



Dunja (eng. Quince)

Stablo je visoko do 7m sa krivim i jako razgranatim granama. Mlade grane i lišće su pokriveni dlakama. Listovi su široko eliptični i po obodu celi.

The tree is up to 7m tall with crooked and strongly branched branches. Young branches and leaves are covered with hairs. The leaves are broadly elliptic and entire around the edges.

Fragaria Vesca

Šumska jagoda
/ Wild Strawberry

Vreme cvetanja / Flowering Time:

Apr/May/Jun

Nektar / Nectar: 3

Polen / Pollen: 3



Šumska jagoda (eng. Wild Strawberry)

Višegodišnja zeljasta biljka sa uspravnom ili poleglom stablikom obraslom dlačicama visine do 30 cm. Listovi su tročlani, sa sedećim jajastim ili romboidnim listićima po obodu nazubljenim. Iz pazuha listova izbijaju vreže koje se ukorenjuju i pomoću njih se jagoda razmnožava.

A perennial herbaceous plant with an upright or prostrate stem overgrown with hairs up to 30 cm high. The leaves are tripartite, with sessile ovoid or rhomboid leaflets serrated around the edge. Buds emerge from the axils of the leaves, which take root and are used by the strawberry to reproduce.

Fragaria Moschata

Jagoda / Strawberry

Vreme cvetanja / Flowering Time:

Apr/May/Jun

Nektar / Nectar: 3

Polen / Pollen: 3



Jagoda (eng. Strawberry)

Zeljasta biljka sa dlakavom uspravnom stabljikom nadvisuje listove. Listovi u prizemnoj rozeti su tročlani sa dugačkim drškama, dlakavi i testerasto nazubljeni.

A herbaceous plant with a hairy upright stem overhanging the leaves. The leaves in the ground rosette are tripartite with long petioles, hairy and saw-toothed.

Brassica Napus

Uljana repica / *Oilseed Rape*

Vreme cvetanja / Flowering Time:

Apr**Nektar / Nectar:** 4

Polen / Pollen: 4



*U*LJANA REPICA (ENG. *O*ILSEED *R*APE)

Zeljasta i dvogodišnja biljka koja može da naraste i do 150 cm. Stabljika uljane repice je glatka, okruglasta, u gornjem dijelu razgranata i crvenkaste boje. Gornji listovi su kopljasti, celi i sedeći, dok se donji nalaze na 10 do 30 cm dugoj peteljci. Cvetovi uljane repice su pravilni, dvopolni i prečnika oko 15 mm. Sastoje se od 4 lapa, 4 žute latice i 6 prašnika, a sakupljaju se u skupove od 20 - 60 u uspravno skupljene cvasti. Plod je mahuna dugačka od 5 do 12 cm, širine do 4 mm, a sadržava 12 do 18 malih, okruglih semenki bogatih uljem.

Herbaceous and biennial plant that can grow up to 150 cm. The stalk of rapeseed is smooth, round, branched in the upper part and reddish in color. The upper leaves are lanceolate, whole and sessile, while the lower ones are located on a 10 to 30 cm long petiole. Rapeseed flowers are regular, bisexual and about 15 mm in diameter. They consist of 4 lobes, 4 yellow petals and 6 stamens, and are collected in groups of 20 - 60 in upright inflorescences. The fruit is a pod 5 to 12 cm long, up to 4 mm wide, and contains 12 to 18 small, round, oil-rich seeds.

Syringa Vulgaris

JORGOVAN / LILAC

Vreme cvetanja / Flowering Time:

Apr/May

Nektar / Nectar: 1

Polen / Pollen: 1



Jorgovan (eng. Lilac)

Listopadno i grmoliko malo drvo visine do 10 m i do 30 cm u prečniku. Pupoljci su ovalni i imaju pik na vrhu, Listovi su uglavnom srcasti, bez dlačica, bez režnjeva sa šiljatim vrhom na kratkim drškama. Cvetovi su ljubičasti u labavim, uspravnim i dugim metlicama.

Deciduous and bushy small tree up to 10 m tall and up to 30 cm in diameter. The buds are oval and have a peak at the top. The leaves are mostly heart-shaped, hairless, without lobes with a pointed tip on short petioles. The flowers are purple in loose, erect and long panicles.

Ranunculus Acris

Ljutić / Meadow Buttercup

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul/Aug/Oct

Nektar / Nectar: 1

Polen / Pollen: 3

Ljutić (eng. Meadow Buttercup)

Višegodišnja zeljasta biljka sa uspravnom stabljikom visine izmedju 30 i 100 cm. Najčešće je jako granata, dlakava i sa mnogo cvetova. Listovi su na dugim drškama, duboko dlanasto izdeljeni na 3 do 7 režnjeva, koji su klinasto izdeljeni na po 3 režnja i nepravilno krupno testerasti. Cvetovi su zlatnožuti i sjajni.

A perennial herbaceous plant with an upright stem between 30 and 100 cm tall. Most often it is very garnet, hairy and with many flowers. The leaves are on long petioles, deeply palmately divided into 3 to 7 lobes, which are wedge-shaped into 3 lobes each and irregularly coarsely serrated. The flowers are golden yellow and shiny.



Lotos Corniculatus

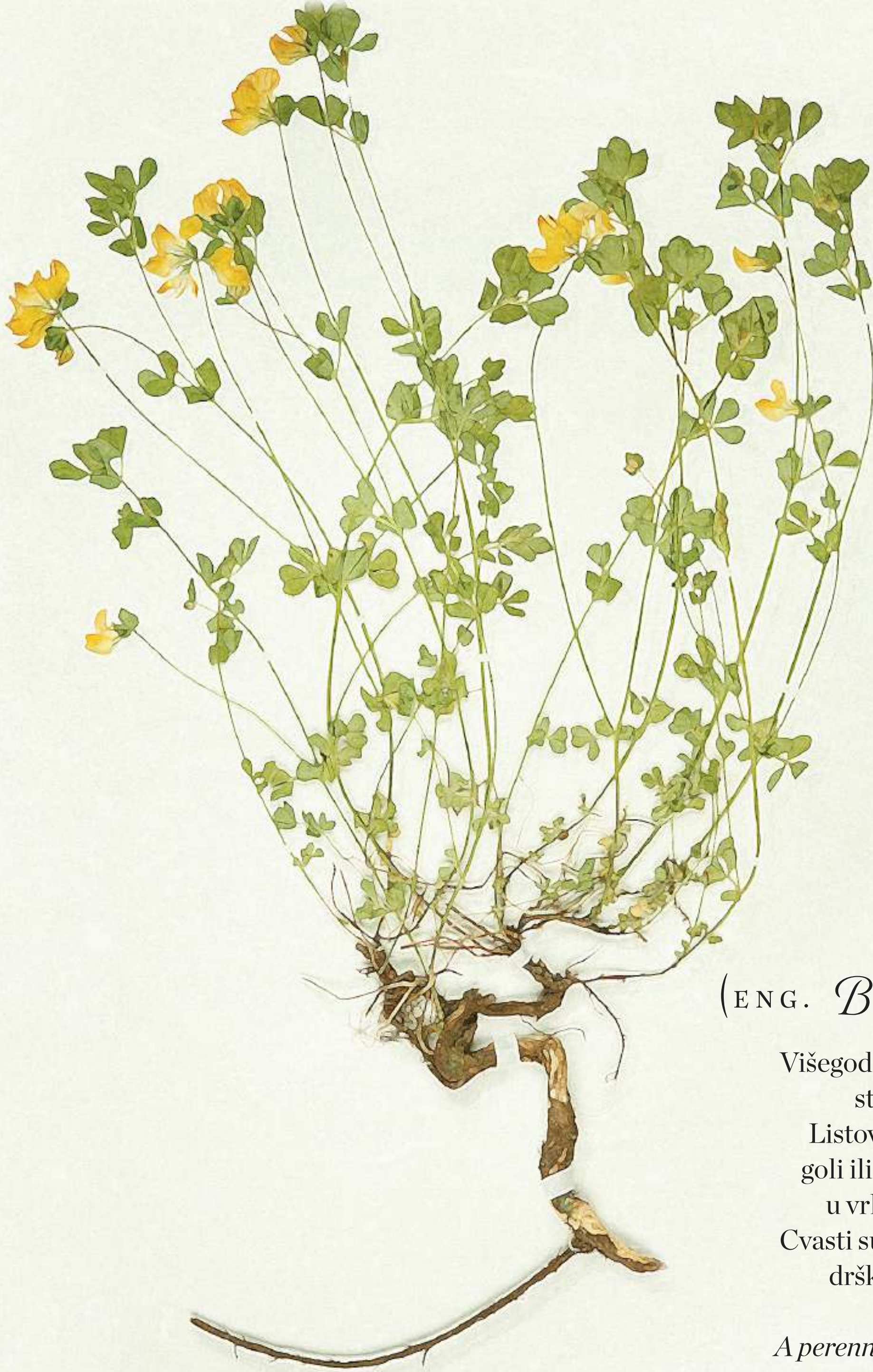
Zvezdan / Bird's-foot Trefoil

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 4

Polen / Pollen: 4



Zvezdan (eng. Bird's-foot Trefoil)

Višegodišnja biljka sa ustajućim ili poleglim stablom bez stolona dugim do 40 cm. Listovi su na kratkim drškama, petočlani, goli ili malo dlakavi. Zalisci su redukovani u vrlo kratke bodlje ili žlezdane kvržice. Cvasti su postavljeni uspravno na dugačkim drškama i broje od 2 do 6 žutih cvetova.

A perennial plant with an erect or decumbent stem without stolons up to 40 cm long. The leaves are on short petioles, five-parted, glabrous or slightly hairy. The valves are reduced to very short spines or glandular nodules. The inflorescences are placed upright on long stems and number from 2 to 6 yellow flowers.

Veronica Chamaedrys

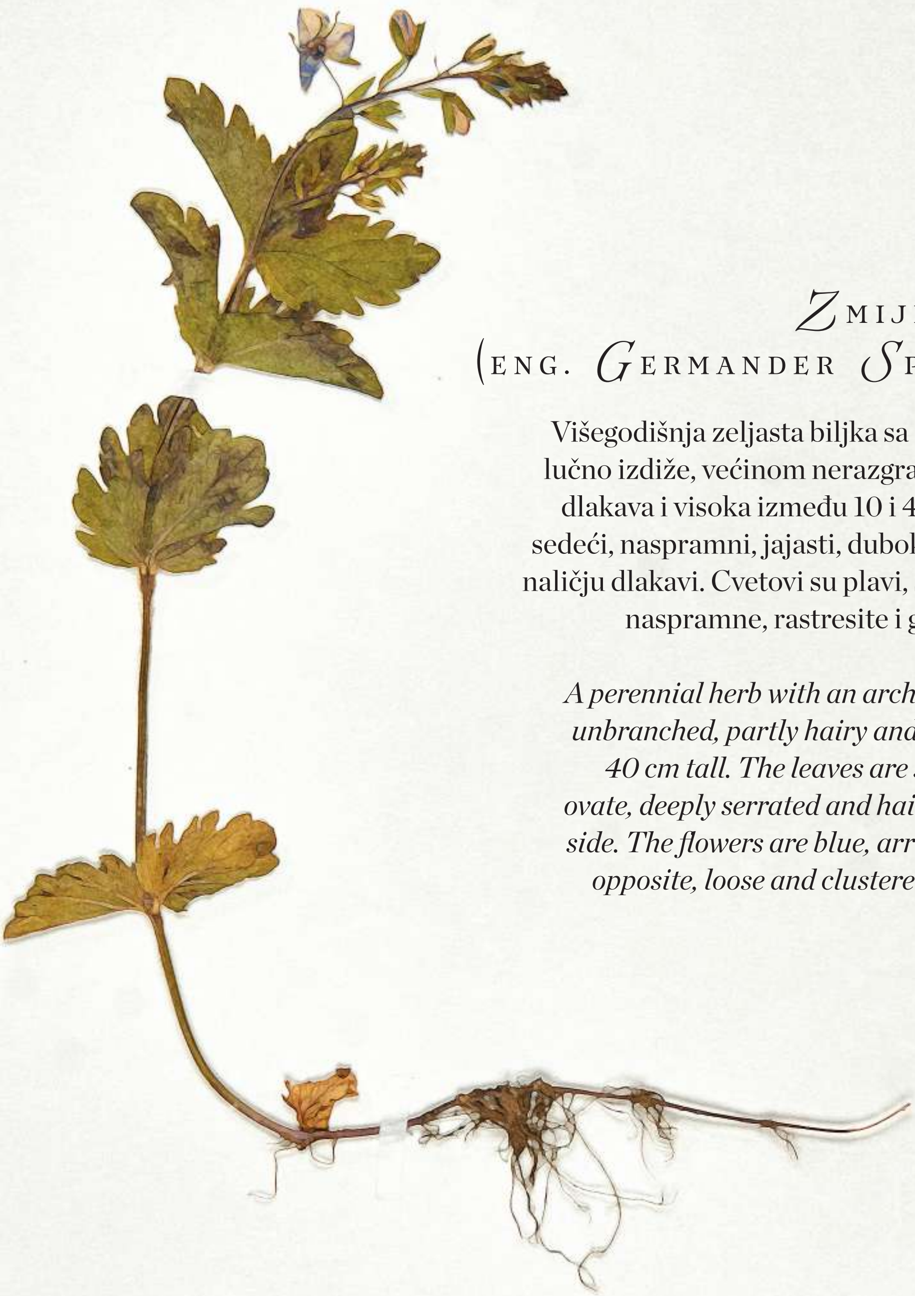
Zmijina trava / Germander Speedwell

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul/Aug

Nektar / Nectar: 3

Polen / Pollen: 3



Zmijina trava (eng. Germander Speedwell)

Višegodišnja zeljasta biljka sa stabljiko koja se lučno izdiže, većinom nerazgranata, delimično dlakava i visoka između 10 i 40 cm. Listovi su sedeći, naspramni, jajasti, duboko testerasti i na naličju dlakavi. Cvetovi su plavi, složeni u bočne, naspramne, rastresite i grozdaste cvasti.

A perennial herb with an arching stem, mostly unbranched, partly hairy and between 10 and 40 cm tall. The leaves are sessile, opposite, ovate, deeply serrated and hairy on the reverse side. The flowers are blue, arranged in lateral, opposite, loose and clustered inflorescences.

Symphytum Officinale

Gavez / Comfrey

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 2



Gavez (eng. Comfrey)

Višegodišnja zeljasta biljka visine između 30 i 60 cm. Stablo je zeljasto i u gornjem delu se grana, dlakavo je i čvrsto a iznutra šuplje. Listovi su takođe dlakavi i jajasti. Cvetovi ružičasti ili žućkastobeli na oborenim drškama.

A perennial herb between 30 and 60 cm tall. The stem is herbaceous and branches in the upper part, it is hairy and firm and hollow inside. The leaves are also hairy and ovate. Pink or yellowish-white flowers on drooping stems.

Geranium Macrorrhizum

ZDRAVAC / BIGROOT GERANIUM

Vreme cvetanja / Flowering Time:

Apr/May/Jun

Nektar / Nectar: 4

Polen / Pollen: 1



Zdravac (eng. Bigroot Geranium)

Višegodišnja zeljasta biljka, visine između 20 i 40 cm, sa uspravnim stablom. Listovi su na dugačkim drškama i sa liskama izdeljenim na krupne ražnjeve. Cvetovi su jasno uočljivi sa crvenim do tamnocrvenim kruničnim i šiljatim, jajstog oblika, čašičnim listićima.

Perennial herbaceous plant, height between 20 and 40 cm, with an upright stem. The leaves are on long petioles and the leaves are divided into large spikes. The flowers are clearly visible with red to dark red corollas and pointed, egg-shaped, sepals.

Ornithogalum Umbellatum

Ptičije mleko / *Grass Lily*

Vreme cvetanja / Flowering Time:

Apr/May/Jun

Nektar / Nectar: 1

Polen / Pollen: 1



Ptičije mleko (eng. Grass Lily)

Višegodišnja zeljasta biljka sa uspravnim i golim stablom do 40 cm. Obično ima 4 do 9 prizemnih linearnih listova dugih do 50 cm. Cvetovi su beli sa zelenom uzdzžnom prugom na naličju, sakupljeni u cvast oblika štitolike gronje koja se nalazi na vrhu stabla.

A perennial herbaceous plant with an upright and bare stem up to 40 cm. It usually has 4 to 9 ground linear leaves up to 50 cm long. The flowers are white with a green ridge on the reverse, collected in a shield-shaped inflorescence located at the top of the tree.

Aesculus Hippocastanum

Divlji kesten / Horse Chestnut

Vreme cvetanja / Flowering Time:

Apr/May/Jun

Nektar / Nectar: 3

Polen / Pollen: 3



Divlji kesten (eng. Horse Chestnut)

Listopadno drvo, visoko do 30 m, sa velikom, okruglastom i gusto lisnatom krošnjom. Listovi su naspramni prstasto deljeni na 5 do 7 listića na zajedničkoj peteljci. Listovi su izduženo eliptični i pri osnovi klinasti. Cvetovi su beli i složeni u uspravnim piramidalnim grozdastim cvastima

Deciduous tree, up to 30 m tall, with a large, round and densely leafy crown. The leaves are opposite, finger-like, divided into 5 to 7 leaflets on a common petiole. The leaves are elongated elliptic and wedge-shaped at the base. The flowers are white and arranged in upright pyramidal racemes.

Alliaria Petiolata

Lučac / Garlic Mustard

Vreme cvetanja / Flowering Time:

Apr/May/Jun

Nektar / Nectar: 1

Polen / Pollen: 1

Lučac (eng. Garlic Mustard)

Višegodišnja zeljasta biljka sa uspravnim i golim stablom do 40 cm. Obično ima 4 do 9 prizemnih linearnih listova dugih do 50 cm. Cvetovi su beli sa zelenom uzdzžnom prugom na naličju, sakupljeni u cvast oblika štitolike gronje koja se nalazi na vrhu stabla.

A perennial herbaceous plant with an upright and bare stem up to 40 cm. It usually has 4 to 9 ground linear leaves up to 50 cm long. The flowers are white with a green ridge on the reverse, collected in a shield-shaped inflorescence located at the top of the tree.



Plantago Lanceolata

Bokvica muška / Ribwort Plantain

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul/Aug/Sep

Nektar / Nectar: 0

Polen / Pollen: 4





Bokvica muška (eng. Ribwort Plantain)

Višegodišnja zeljasta biljka sa nekoliko uspravnih ili ustajućih cvetnih stabljika visine 5 do 50 cm. Listovi sakupljeni u prizemnoj rozeti su lancetasti ili linearno lancetasti na dužim drškama. Na vrhu su postepeno suženi. Cvetovi su sakupljeni u duguljastim, cilindričnim gustim klasastim cvastima.

A perennial herb with several erect or erect flower stems 5 to 50 cm high. The leaves collected in a ground rosette are lanceolate or linear-lanceolate on longer petioles. They are gradually narrowed at the top. The flowers are collected in oblong, cylindrical dense spike inflorescences.

Plantago Media

Bokvica ženska / Hoary Plantain

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul/Aug/Sep

Nektar / Nectar: 0

Polen / Pollen: 4

Bokvica ženska (eng. Hoary Plantain)

Višegodišnja zeljasta biljka visine od 10 do 50 cm. Listovi su sakupljeni u prizemnoj rozeti. Eliptičnog ili jajastog su oblika na širokoj dršci ili sedeći sa 5 do 9 nerava po celoj dužini lista. Cvetovi su beli ili svetloljubičasti u zbijenim cilindričnim klasastim cvastima na vrhu stabljike.

Perennial herb from 10 to 50 cm tall. The leaves are collected in a ground rosette. They are elliptical or egg-shaped on a wide stem or sessile with 5 to 9 nerves along the entire length of the leaf. The flowers are white or light purple in dense cylindrical racemes at the top of the stem.



Capsella Bursa-pastoris

*H*oću-neću / hepherd's *P*urse

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul

Nektar / Nectar: 1

Polen / Pollen: 1



Hoću-neću (eng. Shepherd's Purse)

Jednogodišnja ili dvogodišnja zeljasta biljka visine 15 do 60 cm. Stabljika je uspravna, jednostavna ili razgranata, izbrazdana i većinom gola. Listovi na stabljici su celi ili nazubljeni, sedeći obuhvataju stabljiku. Cvetovi su beli i na petiljkama obrazuju najpre štitoliku a kasnije izduženu grozdastu cvast.

Annual or biennial herbaceous plant 15 to 60 cm high. The stem is erect, simple or branched, furrowed and mostly bare. The leaves on the stem are entire or toothed, sessile and enclose the stem. The flowers are white and on the petioles they first form a shield-like and later an elongated raceme inflorescence.

Glechoma Hederacea

Dobričica / *Ground-ivy*

Vreme cvetanja / Flowering Time:

Apr/May/Jun/Jul

Nektar / Nectar: 3

Polen / Pollen: 3

Dobričica (eng. Ground-ivy)

Višegodišnja zeljasta biljka visine 10 do 50 cm. Stabljika je četvorouglasta, pizeća, gola ili delimično dlakava. Listovi su krupno nazubljeni i bubrežasto srcasti, naspramni na drškama. Cvetovi su ljubičastoplavi sakupljeni po 3-4 u pazusima gornjih i srednjih listova u prividne pršljenove.

Perennial herb 10 to 50 cm tall. The stem is quadrangular, pubescent, bare or partially hairy. The leaves are coarsely toothed and kidney-shaped, opposite on the stems. The flowers are purple-blue collected in clusters of 3-4 in the axils of the upper and middle leaves in apparent whorls.



Euphorbia Cyparissias

Mlečika / Cypress Spurge

Vreme cvetanja / Flowering Time:

Apr/May/Jun

Nektar / Nectar: 1

Polen / Pollen: 3



Mlecika (eng. Cypress Spurge)

Višegodišnja zeljasta bilja visine od 15 do 60 cm. Stabljika je uspravna, obično ih ima više, pri vrhu je razgranata, gola ili pomalo dlakava. Listovi su sedeći spiralno gusto raspoređeni, lancetasti, uski i goli a pri vrhu zatupasti ili kratko ušiljeni. Cetovi su žutozeleni, kasnije postaju purpurni i na dugim drškama grade štitaste cvasti.

Perennial herb from 15 to 60 cm tall. The stem is upright, there are usually more of them, it is branched near the top, bare or slightly hairy. The leaves are sessile, spirally densely arranged, lanceolate, narrow and glabrous and blunt or shortly pointed at the top. The stems are yellow-green, later turn purple and form shield-like inflorescences on long stems.

Quercus Cerris

Cer / Turkey Oak

Vreme cvetanja / Flowering Time:

Apr/May

Nektar / Nectar: 1

Polen / Pollen: 4



Cer (eng. Turkey Oak)

Listopadno drvo visoko i preko 35 m. Muški cvetovi su sakupljeni u rese a ženski su pojedinačni ili u grupicama do 8.

Deciduous tree over 35 m high. Male flowers are collected in tassels, and female flowers are single or in groups of up to 8.

Fraxinus Angustifolia

Poljski jasen / Narrow-leaved Ash

Vreme cvetanja / Flowering Time:

Apr

Nektar / Nectar: 1

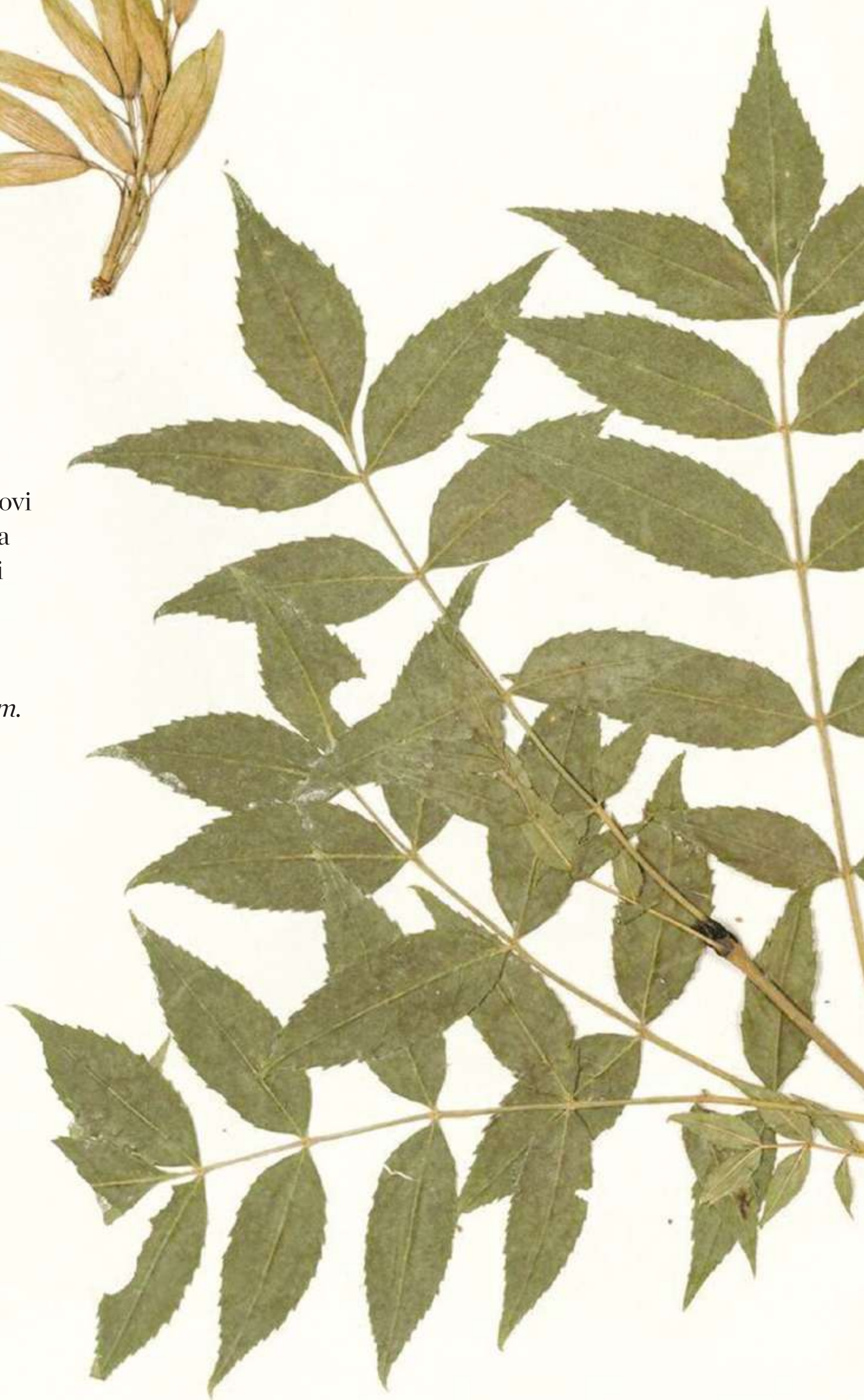
Polen / Pollen: 3



Poljski jasen (eng. Narrow-leaved Ash)

Dostiže visinu i do 30 m. Cvetovi su crvenkastosmeđi, bez čašica i krunicei dvopolni su. Cvetovi su sakupljeni u nerazgranate, u početku uspravne cvasti.

It reaches a height of up to 30 m. The flowers are reddish brown, without sepals and corolla, and are bisexual. The flowers are collected in unbranched, initially erect inflorescences.



Robinia Pseudoacacia

Bagrem / Black Locust

Vreme cvetanja / Flowering Time:

May/Jun

Nektar / Nectar: 4

Polen / Pollen: 1



Bagrem (eng. Black Locust)

Dostiže visinu do 25 m, ima retku i svetlu kro[nju koja je uglavnom okrugla ili duguljasta. Mlade grane imaju oštro zašiljene trnove koji štite pupoljke. Listovi su neparno perasti, sastavljeni od 9 do 21 listića koji su eliptični. Cvetovi su beli, sakupljeni po 15 do 20 u gvozdaste, rastresite cvasti.

It reaches a height of up to 25 m, has a sparse and bright canopy that is mostly round or oblong. Young branches have sharply pointed thorns that protect the buds. The leaves are oddly pinnate, composed of 9 to 21 leaflets that are elliptical. The flowers are white, collected 15 to 20 in iron-like, loose inflorescences.

Papaver Rhoeas

Bulka / Poppy

Vreme cvetanja / Flowering Time:

May/Jun

Nektar / Nectar: 0

Polen / Pollen: 4



Bulka (eng. Poppy)

Jednogodišnja, retko dvogodišnja, biljka visoko između 20 i 90 cm. Stabljika je uspravna, jednostavna ili granata, obrasla dugim dlaka. Listovi su obično sedeći, izduženo jajasti ili eliptični, perasto ili dvostruko perasto usečeni, režnjevi različito urezani. Cvetovi su bledocrveni ili tamno crveni, retko beli i ljubičasti, pri osnovi sa crnom mrljom.

Annual, rarely biennial, plant between 20 and 90 cm high. The stem is erect, simple or branched, overgrown with long hairs. The leaves are usually sessile, oblong-ovate or elliptic, pinnately or doubly pinnately cut, lobes variously incised. The flowers are pale red or dark red, rarely white and purple, with a black spot at the base.

Rubus Idaeus

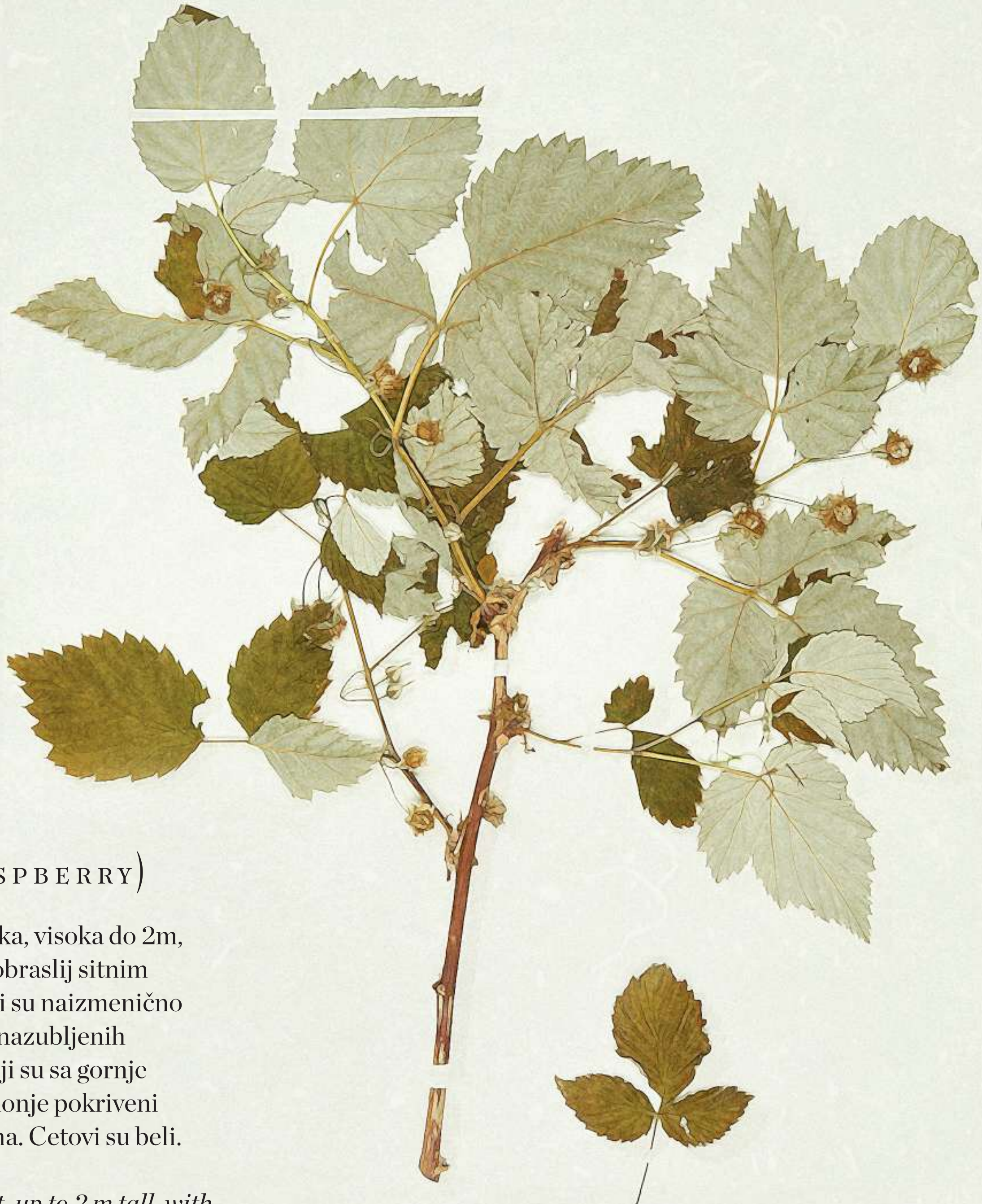
Malina / Raspberry

Vreme cvetanja / Flowering Time:

May/Jun/Jul

Nektar / Nectar: 4

Polen / Pollen: 3



*M*ALINA (ENG. *R*ASPBERRY)

Višegodišnja biljka, visoka do 2m, sa više stabljika obraslij sitnim bodljama. Listovi su naizmenično perasti sa 3 do 7 nazubljenih ovalnih listića koji su sa gornje strane goli, a sa donje pokriveni vunastim dlakama. Cetovi su beli.

A perennial plant, up to 2 m tall, with several stems overgrown with small spines. The leaves are alternately pinnate with 3 to 7 toothed oval leaflets that are bare on the upper side and covered with woolly hairs on the lower side. Cets are white.

Rosa Canina

Divlja ruža - Šipak / Dog Rose

Vreme cvetanja / Flowering Time:

May/Jun/Jul

Nektar / Nectar: 1

Polen / Pollen: 4

Divlja ruža - Šipak (eng. Dog Rose)

Listopadni žbun visine do 4 m, sa srpastim i oštrim bodljama na granama. Listovi su neparno perasti, sa 5 do 7 listića koji su jajasti i goli i po obodu testerasti. Cvetovi su svetloružičasti ili beli, do 3 u skupini.

Deciduous shrub up to 4 m tall, with sickle-shaped and sharp spines on the branches. The leaves are oddly pinnate, with 5 to 7 leaflets that are ovate and glabrous and serrated around the edges. The flowers are light pink or white, up to 3 in a group.



Leontodon Hispidus

Goloček / Bristly Hawkbit

Vreme cvetanja / Flowering Time:

May/Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 3

Goloček (eng. Bristly Hawkbit)

Višegodišnja zeljasta biljka, visoka između 10 i 60 cm, sa jednostavnom usptavnom stabljikom, obraslom sitnim dlačicama. Listovi formiraju rozetu, duguljasto su lancetasti, sivozeleni, suženi u드šci, obrasli dlačicama, po obodu lično izrubljeni, rasto režnjevati ili celi. Cvetovi su sakupljeni u pojedinačne glavičaste cvasti na vrhu stabljike.

Perennial herbaceous plant, between 10 and 60 cm tall, with a simple erect stem covered with fine hairs. The leaves form a rosette, they are oblong-lanceolate, grey-green, narrowed in the stem, covered with hairs, on the edge they are individually cut, lobed or entire. The flowers are collected in individual inflorescences at the top of the stem.



Rubus Caesius

Divlja kupina / European Dewberry

Vreme cvetanja / Flowering Time:

May/Jun/Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 4



Divlja kupina (eng. European Dewberry)

Žbun sa šibolikim stabljikama visine do 150 cm. Listovi su trodelni, sa donje strane svetlije boje, Listići su jajasti često iz 3 ražnja oštro zašiljeni, često grubo dvojno testerasti. 2 do 5 belih cvetova čine gornjastu cvast na vrhu grančice ili u pazuhu gornjih listova.

Shrub with slender stems up to 150 cm tall. The leaves are three-parted, with a lighter color on the underside. The leaflets are ovate, often sharply pointed from 3 spits, often roughly double-serrated. 2 to 5 white flowers form the upper inflorescence at the top of the branch or in the axil of the upper leaves.



Rhinanthus Minor

Petlova kresta / Yellow Rattle

Vreme cvetanja / Flowering Time:

May/Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 3



Petlova kresta (eng. Yellow Rattle)

Jednogodišnja zeljasta biljka vinine između 5 i 50 cm. Stabljika je uspravna, nerazgranata ili samo u delu razgranata, proređeno dlakava, sa uzdužnim isprekidanim crnim linijama ili bez njih. Listovi su izduženi, jajasti, lancetasti do uzano lansetasti, testerasto nazubljeni. Cvetovi su svetložuti, obrazuju grozdastu cvast na vrhu stabljike.

An annual herbaceous vine plant between 5 and 50 cm. The stem is erect, unbranched or only partially branched, sparsely hairy, with or without longitudinal dotted black lines. The leaves are elongated, ovate, lanceolate to narrowly lanceolate, saw-toothed. The flowers are light yellow, forming a clustered inflorescence at the top of the stem.

Medicago Lupulina

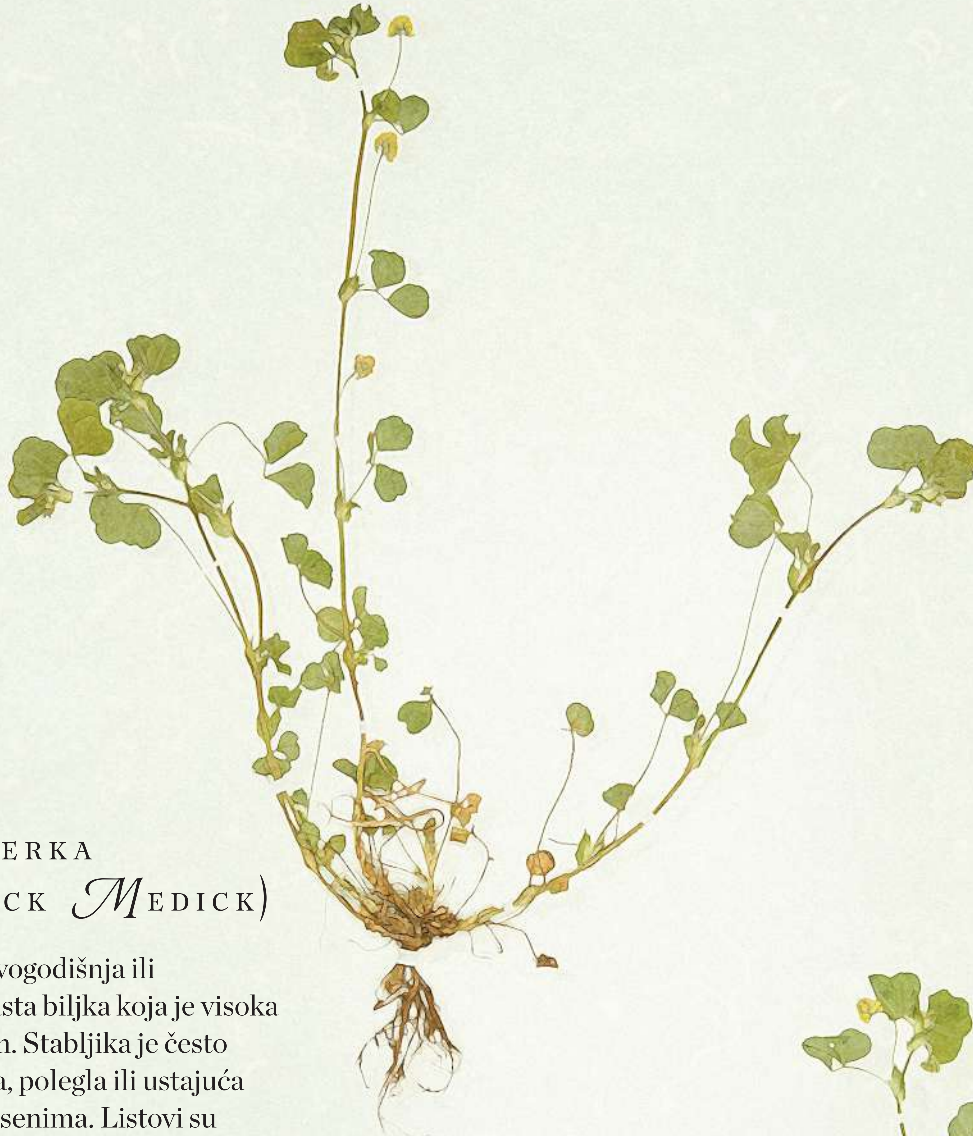
Žuta lucerka / Black Medick

Vreme cvetanja / Flowering Time:

May/Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 3



Žuta lucerka (eng. Black Medick)

Jednogodišnja, dvogodišnja ili višegodišnja zeljasta biljka koja je visoka između 10 i 30 cm. Stabljika je često veoma razgranata, polegla ili ustajuća i u zatvorenim busenima. Listovi su oblojajasti ili široko eliptični. Cvetovi su žuti na peteljkama i obrazuju cvast u obliku zbijene okrugle glavice.

An annual, biennial or perennial herb that is between 10 and 30 cm tall. The stem is often very branched, decumbent or erect and in closed sods. The leaves are ovate or broadly elliptic. The flowers are yellow on the stalks and form an inflorescence in the form of a compact round head.



Trifolium Pratense

Crvena detelina / Red Clover

Vreme cvetanja / Flowering Time:

May/Jun/Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 4



Crvena detelina (eng. Red Clover)

Višegodišnja zeljasta biljak visine između 20 i 50 cm. Stabljike polaze iz pazuha listova rozete, uspravne su i samo pri osnovi se izdižu, nerazgranate su ili sa kratkim granama, izbrazdane i dlakave, Listovi su τročlani, jajasti ili duguljasti sa vrlo kratkim drškama. Cvetovi su crveni, ređe beli, u glavičastoj cvasti.

Perennial herb between 20 and 50 cm tall. The stems start from the axils of the rosette leaves, they are upright and only rise at the base, they are unbranched or with short branches, furrowed and hairy. The leaves are tripartite, ovate or oblong with very short petioles. The flowers are red, less often white, in a heady inflorescence.

Trifolium Repens

Bela detelina / White Clover

Vreme cvetanja / Flowering Time:

May/Jun/Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 1



Bela detelina (eng. White Clover)

Višegodišnja zeljasta biljka sa golim puzećim stablom dugim do 40 cm. Listovi su sa tri sedeća listića na dugim golim drškama, oblojajasti do eliptičnij slabo usečeni i nazubljeni. Cvetovi su beli ili ružičasti u glavicama na dugim drškama.

A perennial herbaceous plant with a bare creeping stem up to 40 cm long. The leaves have three sessile leaflets on long bare petioles, obovate to elliptic, weakly cut and toothed. The flowers are white or pink in heads on long stems.

Hypericum Perforatum

Kantarion / St John's Wort

Vreme cvetanja / **Flowering Time:**

May/Jun/Jul/Aug/Sep

Nektar / **Nectar:** 0

Polen / **Pollen:** 1



Kantarion (eng. St John's Wort)

Višegodišnja zeljasta biljka visine do 100 cm. Ima vrlo čvrstu, uglastu, uspravnu i razgranatu stabljiku sa naspramnim granama. Listovi su naspramni, bez drške, duguljasto jajasti, goli, svetlozelen boje. Cvetovi su svetložuti, srednje veličine i obrazuju na vrhu stabljike štitaste cvasti.

Perennial herbaceous plant up to 100 cm tall. It has a very strong, angular, upright and branched stem with opposite branches. The leaves are opposite, without a handle, oblong-ovate, bare, light green in color. The flowers are light yellow, medium in size and form shield inflorescences at the top of the stem.

Rosa Centifolia

Ruža / Provence Rose

Vreme cvetanja / Flowering Time:

May/Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 3

Polen / Pollen: 3

Ruža
(eng. Provence Rose)

Višegodišnji ukrasni žbun visine do 2 m. Lišće je naizmenično poređano na stablu. Kod većina vrsta dugo je između 5 i 15 cm i perastog je oblika sa 5 do 9 lisna zaliska. Zalisci obično imaju zupčastu ivicu, a često i nekoliko manjih trnova na donjem delu stabljike. Stbljika je uspravna, razgranata, sa jakim, oštrim i unazad povijenim trnovima. Cvetne glavice su sastavljene od mnogobrojnih kruničnih listića ružičaste boje i žutog središta.

Perennial decorativ shrub up to 2 m high. The leaves are arranged alternately on the stem. In most species, it is between 5 and 15 cm long and pinnate with 5 to 9 leaflets. The valves usually have a toothed edge, and often a few small thorns on the lower part of the stem. The stem is upright, branched, with strong, sharp and backward bent thorns. The flower heads are made up of numerous pink petals with a yellow center.



Galium Cruciata

Đurdjevak / Crosswort

Vreme cvetanja / Flowering Time:

Apr/May

Nektar / Nectar: 1

Polen / Pollen: 1



Đurdjevak (eng. Crosswort)

Višegodišnja zeljasta biljka visoka do 50 cm. Stabljika je uspravna ili polu-uspravna, četvorouglasta, dlakava. Listovi su duguljasti, elipsasto tupi ili šiljati, krstasto postavljeni. Cvetovi su sitni žuti do žuto-zelenkasti sakupljeni u okruglo-spljoštene cvasti.

Perennial herbaceous plant up to 50 cm tall. The stem is erect or semi-erect, quadrangular, hairy. The leaves are oblong, elliptically obtuse or pointed, cruciform. The flowers are small, yellow to yellow-green, collected in round-flattened inflorescences.

Crataegus

Glog / Hawthorn

Vreme cvetanja / Flowering Time:

May/Jun

Nektar / Nectar: 1

Polen / Pollen: 1

Glog (eng. Hawthorn)

Listopadni grm do 6m visine. Grančice su trnovite, gole ili malo dlakave. Listovi su promenjivog oblika na kraćim peteljkama sa 3 do 7 duboko razdvojenih režnjeva. Cvetovi su beli, sakupljeni po 10 do 20 u uspravne gronjaste cvasti.

Deciduous shrub up to 6m tall. Twigs are thorny, bare or slightly hairy. The leaves are variable in shape on shorter petioles with 3 to 7 deeply separated lobes. The flowers are white, collected in 10 to 20 clusters in upright racemes.



Ajuga Pyramidalis

Ivica / Pyramidal Buglen

Vreme cvetanja / Flowering Time:

May/Jun

Nektar / Nectar: 3

Polen / Pollen: 1

Ivica
(eng Pyramidal Bugle)

Višegodišnja zeljasta biljka, jednostavnih dlakavih stabljika visine od 5 do 35cm. Listovi na stabljici su naspramni, ukršteno postavljeni tako da čitava biljka ima petougaono piramidalan oblik. Listovi na kratkoj dršci prema vrhu stabljike su sve manji. Cvetovi su otvoreno plave boje po 2 do 6 sakupljeni u prividne pršljenove.

Perennial herbaceous plant, with simple hairy stems 5 to 35 cm high. The leaves on the stem are opposite, placed crosswise so that the whole plant has a pentagonal pyramidal shape. The leaves on the short petiole are getting smaller towards the top of the stem. The flowers are light blue in 2 to 6 clusters collected in apparent whorls.



Filipendula Hexapetala

Surciča / Dropwort

Vreme cvetanja / Flowering Time:

May/Jun

Nektar / Nectar: 3

Polen / Pollen: 3



Surčica (eng. Dropwort)

Višegodišnja zeljasta biljka sa golim puzećim stablom dugim do 40 cm. Listovi su sa tri sedeća listića na dugim golim drškama, oblojajasti do eliptičnij slabo usečeni i nazubljeni. Cvetovi su beli ili ružičasti u glavicama na dugim drškama.

A perennial herbaceous plant with a bare creeping stem up to 40 cm long. The leaves have three sessile leaflets on long bare petioles, obovate to elliptic, weakly cut and toothed. The flowers are white or pink in heads on long stems.

Sambucus Nigra

Zova / Elder

Vreme cvetanja / Flowering Time:

May/Jun

Nektar / Nectar: 3

Polen / Pollen: 3



Zova (eng. Elder)

Žbun ili drvo visoko do 10 m. Listovi su naspramni, neparno perasti sa 5 do 7 listića. Listići su izduženo jajasti, na vrhu dugačko zašiljeni, a po obodu oštro testerasti. Cvetovi su beli do žućkasto-beli, jakog mirisa u bogatim i gustim vršnim pljosnatim štitastim cvastima.

Shrub or tree up to 10 m tall. The leaves are opposite, oddly pinnate with 5 to 7 leaflets. The leaflets are elongated ovate, long pointed at the top, and sharply serrated around the edge. The flowers are white to yellowish-white, strongly scented in rich and dense apical flat shield inflorescences.

Malva Moschata

Crni slez / Musk Mallow

Vreme cvetanja / Flowering Time:

May/Jun/Jul

Nektar / Nectar: 3

Polen / Pollen: 3



Crni slez (eng. Musk Mallow)

Višegodišnja zeljasta biljka, visoka od 20 do 100 cm. Stabljika je uspravna, sa sa proređenim strčećim dlakama, malo granata. Listovi su prstasto podeljeni na 5 do 7 ražnjeva, koji su jednom ili dva puta perasto deljeni. Cvetovi su ružičastoljubičasti, riđe beli, na dlakavim peteljkama, po 1 do 3 u pazuhu listova, a na vrhu izdanka su u štitastoj cvasti.

Perennial herbaceous plant, 20 to 100 cm tall. The stem is erect, with sparse, protruding hairs, slightly branched. The leaves are finger-shaped, divided into 5 to 7 lobes, which are once or twice pinnately divided. The flowers are pinkish-purple, rarely white, on hairy petioles, 1 to 3 in the leaf axils, and at the top of the shoot they are in a spicate inflorescence.

Potentilla Reptans

Petoprsnica / Creeping Cinquefoil

Vreme cvetanja / Flowering Time:

May/Jun/Jul

Nektar / Nectar: 3

Polen / Pollen: 3



Petoprsnica (eng. Creeping Cinquefoil)

Višegodišnja zeljasta biljka visoka od 30 do 100 cm. Stabljika je često crvenkasta, puzeća, izdužena, končasta, izdanke bočno razvija a na čvorovima se ukorenjuje. Listovi su prstasti sa 5 do 7 članova, samo pojedini u gornjem delu stabljike tročlani ili četvoročlani. Listići su jajasti ili duguljasto objajasti suženi u klinastu osnovu nazubljeni. Cvetovi su zlatnožuti pojedinačni u pazuhu listova, sa dugačkim drškama.

Perennial herb from 30 to 100 cm tall. The stem is often reddish, creeping, elongated, ribbed, the shoots develop laterally and take root at the nodes. The leaves are finger-shaped with 5 to 7 members, only some in the upper part of the stem are three- or four-membered. Leaflets are ovate or oblong-ovate, narrowed into a wedge-shaped base, toothed. The flowers are golden yellow single in the axils of the leaves, with long stalks.

Cornus Sanguinea

Svib / Bloody Dogwood

Vreme cvetanja / Flowering Time:

May

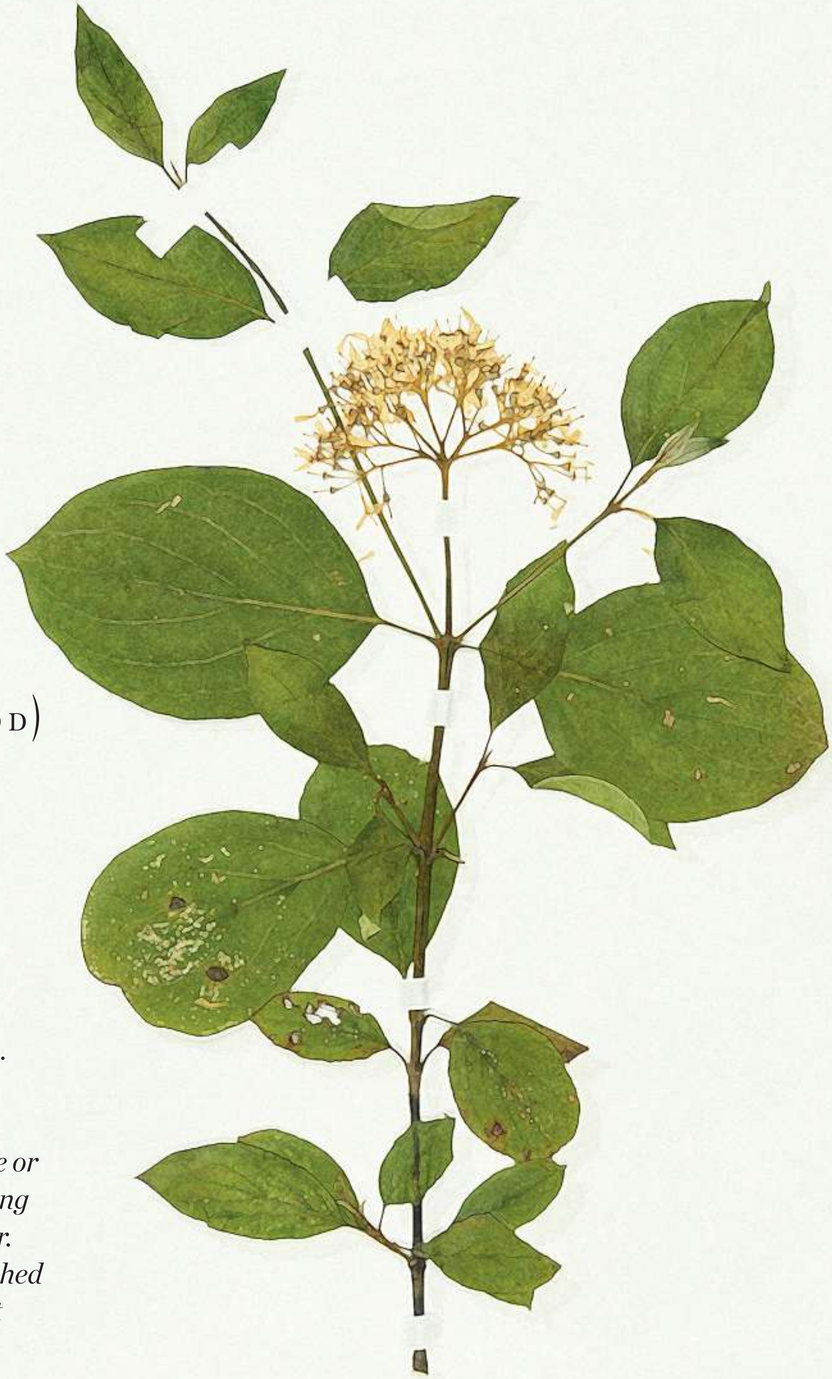
Nektar / Nectar: 3

Polen / Pollen: 3

Svib (eng. Bloody Dogwood)

Listopadni žbun, visok do 5 m sa manje-više uspravnim, tankim i dugim granama. Mlade grane su dlakave i preko zime tamnocrvene. Listovi su na kraćoj dršci sa prileglim dlakama, široko eliptični do jajasti, na vrhu zašiljeni. Cvetovi su beličasti u štitastim cvastima pri vrhu ovogodišnjih grančica. Plodovi su crne okrugle koštunice.

Deciduous shrub up to 5 m tall with more or less upright, thin and long branches. Young branches are hairy and dark red in winter. The leaves are on a short stem with attached hairs, broadly elliptic to ovate, pointed at the top. The flowers are whitish in shield inflorescences near the top of this year's twigs. The fruits are black round drupes.



Helianthus Annuus

SUNCOKRET / SUNFLOWER

Vreme cvetanja / Flowering Time:

Jun/Jul

Nektar / Nectar: 4

Polen / Pollen: 4



Suncokret (eng. Sunflower)

Jednogodišnja biljka visine od 50 do 250 cm. Stablo je različitog stepena razgranatosti. Listovi su krupni, prosti, grubi, hrapavi, često pokriveni tvrdim dlakama, sa dugom drškom, naspramni ili naizmenični. Cvetovi . krunice su vrlo krupni, od više redova najčešće žuto obojenih listića. Cvetno dno je najčešće ravno, ređe malo ispupčeno.

An annual plant with a height of 50 to 250 cm. The tree has different degrees of branching. The leaves are large, simple, rough, rough, often covered with hard hairs, with a long handle, opposite or alternate. Flowers. the corollas are very large, made of several rows of mostly yellow leaves. The base of the flower is usually flat, less often slightly convex.

Rubus Fruticosus

Kupina / Blackberry

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug

Nektar / Nectar: 4

Polen / Pollen: 4



Kupina (eng. Blackberry)

Višegodišnja biljka visine od 50 do 300 cm. Nakon cvetanja iz svakog pojedinog cveta razvija se sitni jagodičasti plod, crvene boje, koji kasnije potamni do tamnoplave i gotovo crne boje.

A perennial plant with a height of 50 to 300 cm. After flowering, each individual flower develops a small berry-like fruit, red in color, which later darkens to a dark blue and almost black color.

Tilia Tomentosa

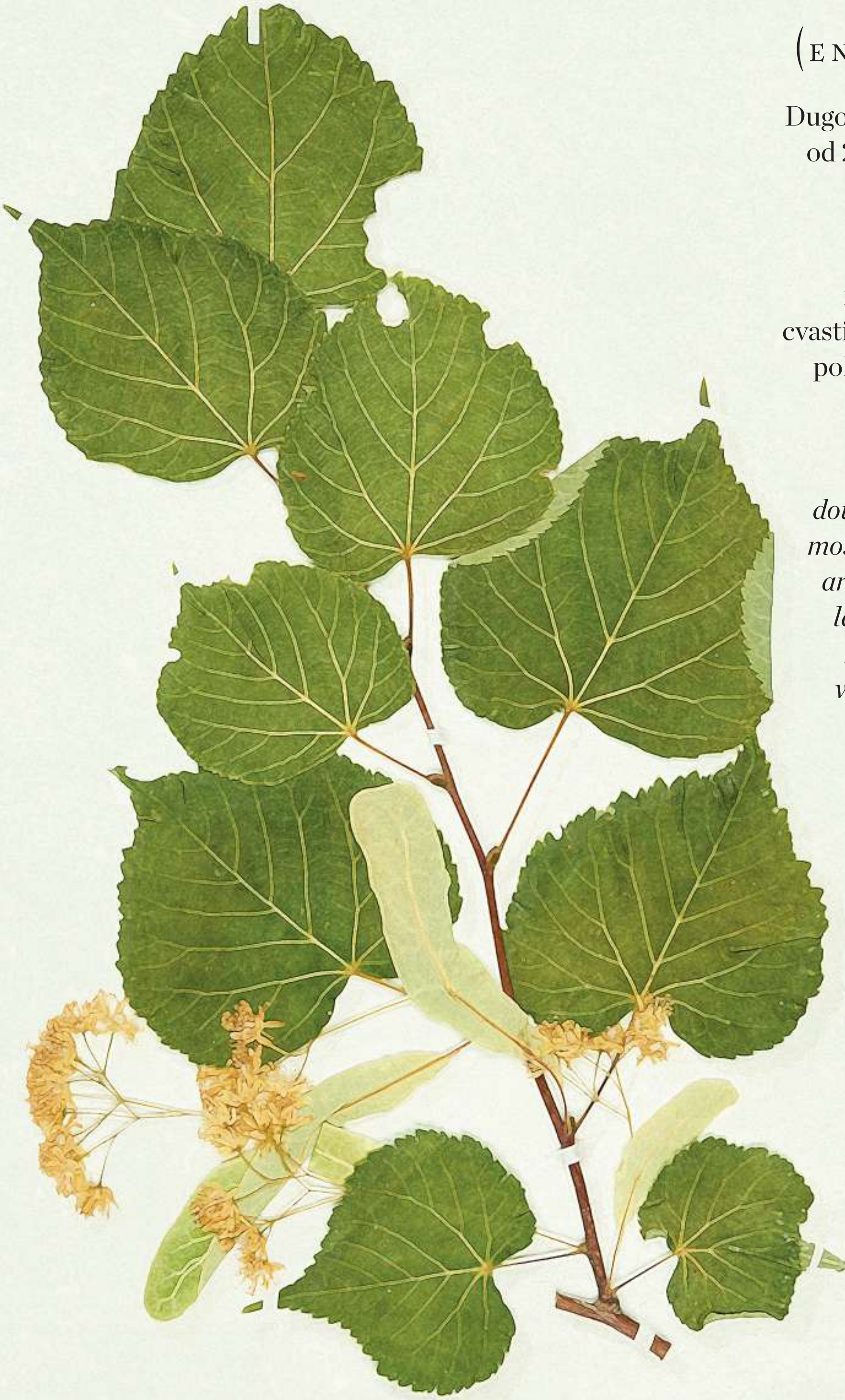
Lipa / Silver Lime

Vreme cvetanja / Flowering Time:

Jun/Jul

Nektar / Nectar: 4

Polen / Pollen: 3



Lipa
(eng. Silver Lime)

Dugoživeće listopadno drvo visoko od 25 do 30 m. Listovi su dvoredi sa dugom peteljkom, većinom srcasto i po obodu testerasti. Cvetovi su krupni, bledožuti, mirišljavi, po 5 do 9 u štitastoj cvasti. Krilati priperak je sedeći, do pola srastao sa cvetnom drškom.

Long-lived deciduous tree 25 to 30 m high. The leaves are double-rowed with a long petiole, mostly heart-shaped and serrated around the edge. The flowers are large, pale yellow, fragrant, 5 to 9 in a shield inflorescence. The winged accessory is sessile, half fused with the flower stem.

Galega Officinalis

Piskavica / Galega

Vreme cvetanja / Flowering Time:

Jun/Jul

Nektar / Nectar: 3

Polen / Pollen: 3



Piskavica (eng. Galega)

Višegodišnja zeljasta biljka visoka do 1 m. Stabljika je uspravna, razgranata uzduž naborana i šuplja. Listovi su neparno perasti od 11 do 21 listića koji su linearnolancelasti. Cvetovi su ljubičastobeli grupisani u grozdaste cvasti, koje se razvijaju iz pazuha gornjih listova. Plod je mahuna do 4 cm dugačka.

Perennial herbaceous plant up to 1 m tall. The stem is upright, branched, wrinkled along and hollow. The leaves are oddly pinnate from 11 to 21 leaflets which are linear-lanceolate. The purple-white flowers are grouped in clustered inflorescences, which develop from the axils of the upper leaves. The fruit is a pod up to 4 cm long.

Vicia Cracca

Ptičja grahorica / Tufted Vetch

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug

Nektar / Nectar: 3

Polen / Pollen: 1



Ptičja grahorica (eng. Tufted Vetch)

Višegodišnja zeljasta biljka visoka od 30 do150 cm. Stabljika je snažna, često poluispravljena, u gornjem delu razgranata, dlakava. Listovi su sa po 10 do 20 pari listića, izduženo lancetasti, na vrhu šiljati, dlakavi. Zalisci su veliki polukopljasti ili linearni. Cvetovi su plavoljubičasti, pri osnovi svetliji, vodoravni u odnosu na dršku cvasti, kasnije vise. Cvasti su guste, sadrže većinom 20 do 30 cvetova, sa drškom približno iste dužine kao i list u čijem se pazuhu nalaze, u početku su upravljeni u jednu stranu.

Perennial herbaceous plant from 30 to 150 cm tall. The stem is strong, often semi-erect, branched in the upper part, hairy. The leaves are with 10 to 20 pairs of leaflets, elongated lanceolate, pointed at the top, hairy. The valves are large semi-lanceolate or linear. The flowers are blue-violet, lighter at the base, horizontal in relation to the stem of the inflorescence, later hanging. The inflorescences are dense, contain mostly 20 to 30 flowers, with a stem approximately the same length as the leaf in the axil of which they are located, initially they are arranged to one side.

Anthemis Arvensis

Poljski prstenak / Corn Chamomile

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

Nektar / Nectar: 1

Polen / Pollen: 1

Poljski prstenak (eng. Corn Chamomile)



Jednogodišnja ili dvogodišnja biljka visine između 20 i 50 cm sa uspravnom i gusto granatom stabljikom. Listovi su naizmenični, sitno perasti. Cvetovi su u glavičastim cvastima veoma nalik na običnu kamilicu, sa kojom je ne treba mešati jer nema ista svojstva, iako je lekovita. Cvast sačinjavaju spoljni beli jezičasti cvetovi i unutrašnji žuti cvetovi.

An annual or biennial plant between 20 and 50 cm tall with an upright and densely branched stem. The leaves are alternate, finely pinnate. The flowers are in heady inflorescences very similar to ordinary chamomile, with which it should not be confused because it does not have the same properties, although it is medicinal. The inflorescence consists of outer white tongue-shaped flowers and inner yellow flowers.



Betonica Officinalis

*R*anilist / *B*etony

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 1



Ranilist (eng. Betony)

Višegodišnja zeljasta biljka, visoka od 20 do 60 cm. Stabljika je uspravna ili izdignuta, nerazgranata ili razgranata, dlakava. Najveći broj listova obrazuje prizemnu rozetu a 2-3 para se nalaze na stabljici. Listovi su široko ili izduženo jajasti do eliptični, da dužom lisnom drškom na oba kraja zaokrugljeni ili pri osnovi srcasto usečeni, duž celog oboda nazubljeni. Cvetovi su karmin crveni, redje beli, po desetak njih složenih u prividne pršljenove koji zajedno grade guste klasove.

Perennial herbaceous plant, 20 to 60 cm tall. The stem is erect or raised, unbranched or branched, hairy. The largest number of leaves forms a ground rosette, and 2-3 pairs are located on the stem. The leaves are broadly or elongately ovate to elliptic, with a longer petiole at both ends rounded or heart-shaped at the base, toothed along the entire rim. The flowers are carmine red, rarely white, a dozen of them arranged in apparent spines that together form dense spikes.

Pentanema Salicinum

Pašnjački oman / Irish Fleabane

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 1

Pašnjački oman (eng. Irish Fleabane)

Višegodišnja zeljasta biljka, visoka od 25 do 85 cm. Stabljika je uspravna, kruta, u donjem delu dlakava, sa mnogo listova, lomljiva. Listovi su jedri, jajasti ili duguljasto lancetasti, pri osnovi srcasti, sedeći, upola obuhvataju stabljiku. Cvetovi su zlatnožuti, u krupnim glavicama, pojedinačni ili u razređenim gronjastim cvastima.

Perennial herbaceous plant, 25 to 85 cm tall. The stem is upright, rigid, hairy in the lower part, with many leaves, brittle. The leaves are smooth, ovate or oblong-lanceolate, cordate at the base, sessile, half covering the stem. The flowers are golden-yellow, in large heads, single or in sparse racemose inflorescences.



Lathyrus Tuberosus

Graor crveni krtolasti / Tuberous Pea

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 1

Graor crveni krtolasti (eng. Tuberous Pea)

Višegodišnja zeljasta biljka, duga od 30 do 120 cm. Stabljika je polegla ili se delimično izdiže, jednostavna ili razgranata, četvorouglasta. Listovi sa uglastom drškom,sa jednim parom listića i snažnom jednostavnom ili razgranatom viticom. Cvetovi tamnocrvene boje, stojeći ili oboreni, po 2-6 obrazuju cvast u dužoj osnovi.

Perennial herbaceous plant, 30 to 120 cm long. Stem prostrate or partially erect, simple or branched, quadrangular. Leaves with an angular petiole, with one pair of leaflets and a strong simple or branched tendril. Flowers of dark red color, standing or fallen, 2-6 each form an inflorescence in a long base.



Convolvulus Arvensis

Poponac / Field Bindweed

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

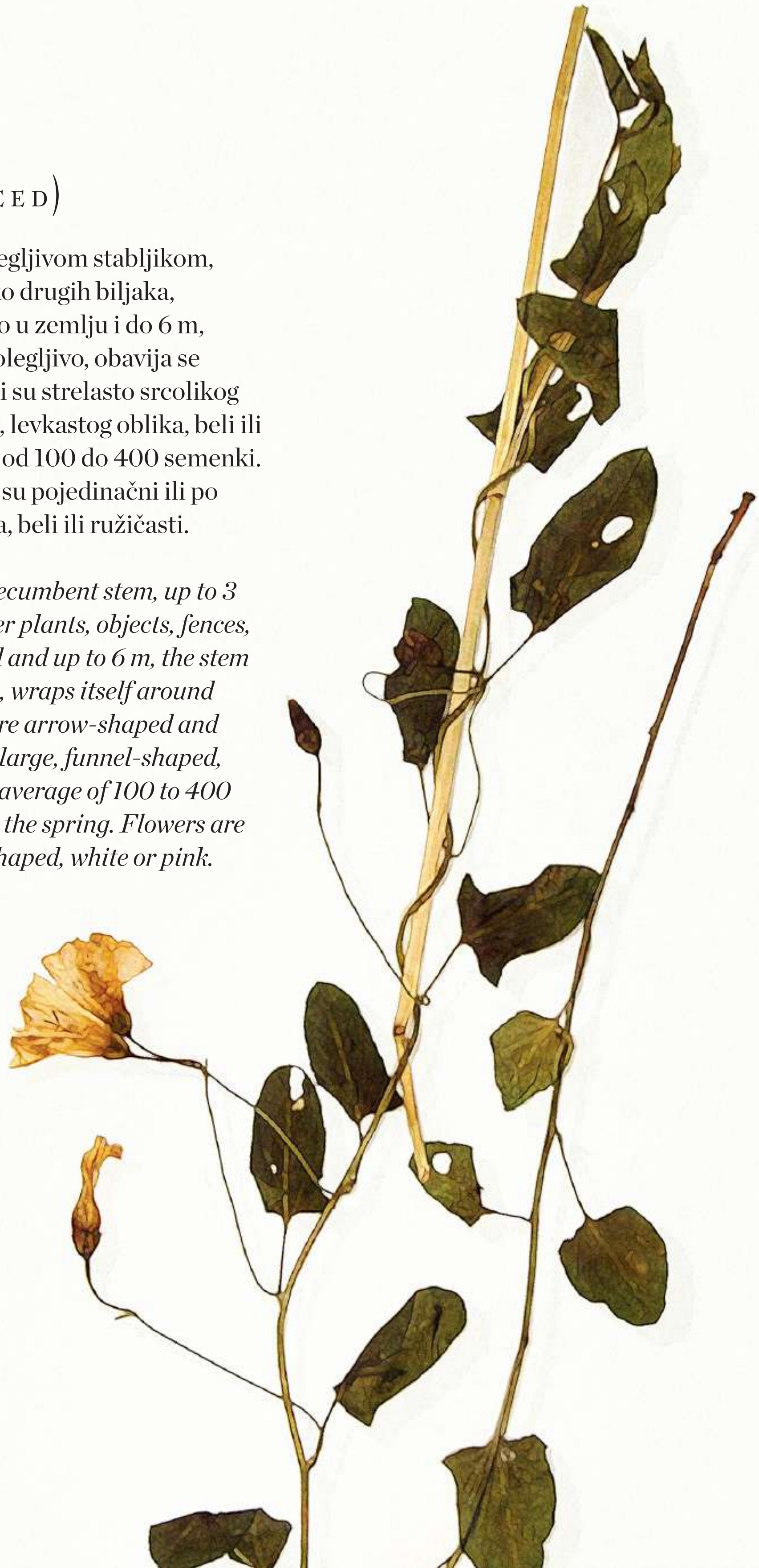
Nektar / Nectar: 1

Polen / Pollen: 1

Poponac (eng. Field Bindweed)

Poponac je višegodišnja biljka sa polegljivom stabljikom, dugom do 3 metra, koja se obavija oko drugih biljaka, predmeta, ograda itd. Prodire duboko u zemlju i do 6 m, stablo je dugo do 2 m, tanko i golo, polegljivo, obavija se oko drugih biljaka i predmeta. Listovi su strelasto srcolikog oblika. Cvetovi su pojedinačni, veliki, levkastog oblika, beli ili ružičasti. Jedna biljka daje prosečno od 100 do 400 semenki. Seme klija obično u proleće. Cvetovi su pojedinačni ili po 2-3 zajedno, krupni su, u obliku levka, beli ili ružičasti.

Poponac is a perennial plant with a decumbent stem, up to 3 meters long, which wraps around other plants, objects, fences, etc. It penetrates deep into the ground and up to 6 m, the stem is up to 2 m long, thin and bare, prone, wraps itself around other plants and objects. The leaves are arrow-shaped and heart-shaped. The flowers are single, large, funnel-shaped, white or pink. One plant produces an average of 100 to 400 seeds. The seeds usually germinate in the spring. Flowers are single or 2-3 together, large, funnel-shaped, white or pink.



Linaria Vulgaris

Žuta zevalica / Toadflax

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 4



Žuta zevalica (eng. Toadflax)

Višegodišnja biljka sa kratkim razgranatim korenom, uspravnom stabljikom od 15 do 90 cm, sa tankim, sivoplavim lišćem dužine od 2 do 6 cm i 1 do 5 mm širine. Stabljika je uspravna, jednostavna ili najčešće samo pri osnovi sa sterilnim izdancima, delimično dlakava, gusto olistala. Listovi su vrlo uski, linearni, sedeći, naspramni. Cvetovi su slični zevalici, 25 do 33 mm dužine, bledožute boje osim donjeg kraja koji ima narandžastu boju.

A perennial plant with a short branched root, an upright stem of 15 to 90 cm, with thin, grey-blue leaves 2 to 6 cm long and 1 to 5 mm wide. The stem is upright, simple or mostly only at the base with sterile shoots, partially hairy, densely leafy. The leaves are very narrow, linear, sessile, opposite. The flowers are similar to yawns, 25 to 33 mm long, pale yellow except for the lower end, which is orange.

Portulaca Grandiflora

Prkos / Rose Moss

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 1

Polen / Pollen: 4



Prkos (eng. Rose Moss)

Višegodišnja zeljasta ukrasna biljka. Stablo je sočno je i mesnato, crvenkaste boje, veoma razgranato. Dostiže visinu od 10 do 20 cm. Listovi su sitni, cilindrični, mesnati i na vrhu zašiljeni. Cvetovi su krupni, 2 do 4 cm u prečniku, pojedinačni i bez mirisa, sa izraženim prašnicima. Mogu biti jednostavni ili puni, sa više redova latica. Javljaju se u raznim bojama: beli, žuti, narandžasti, ružičasti, crveni, ljubičasti ili višebojni.

Perennial herbaceous ornamental plant. The tree is juicy and fleshy, reddish in color, very branched. It reaches a height of 10 to 20 cm. The leaves are small, cylindrical, fleshy and pointed at the top. The flowers are large, 2 to 4 cm in diameter, single and odorless, with prominent stamens. They can be simple or full, with several rows of petals. They appear in various colors: white, yellow, orange, pink, red, purple or multicolored.

Gaillardia Grandiflora

Gailardia šarena / Blanket Flower

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 3

Polen / Pollen: 3



Gailardia šarena (eng. Blanket Flower)

Višegodišnja zeljasta ukrasna biljka. Stabljika je uspravna, visoka 30 do 60 cm. Listovi su izduženo jajasti, sedeći, po obodu celi, sa retkim maljama. Cvetovi obrazuju glavičastu cvast živih boja, najčešće purpurnožute ili razne nijanse ovih boja.

Perennial herbaceous ornamental plant. The stem is upright, 30 to 60 cm high. The leaves are elongated ovate, sessile, entire around the edge, with rare stipules. The flowers form a head-shaped inflorescence of vivid colors, most often purplish-yellow or various shades of these colors.

Centaurea Jacea

Različak / Brown Knapweed

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 3

Polen / Pollen: 3

Različak (eng. Brown Knapweed)

Višegodišnja zeljasta biljka, visoka od 40 do 80 cm. Stablo je uspravno, može biti granato, ali i ne, uglasto, golo ili sa paučinastim dlakama. Listovi su jajasti do lancetasti, nazubljeni ili režnjeviti, donji sa drškom, gornji sedeći. Cvetovi su svetlopurpurni redje beli skupljeni u cvasti glavice koje su najčešće pojedinačne, ređe po par njih zajedno.

Perennial herbaceous plant, 40 to 80 cm tall. The stem is upright, it can be branched or not, angular, bare or with cobweb hairs. The leaves are ovate to lanceolate, toothed or lobed, the lower with a stalk, the upper sessile. The flowers are light purple, rarely white, collected in inflorescences of heads that are usually single, less often a pair of them together.



Calendula Officinalis

Neven / Pot Marigold

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep/Oct/Nov

Nektar / Nectar: 3

Polen / Pollen: 3

Neven
(eng. Pot Marigold)

Jednogodišnja, ređe dvogodišnja, ukrasna biljka, visoka do 50 cm. Stablo nevena je uspravno, granato i izbrazdano i pokriveno je kratkim i čvrstim dlačicama. Oblik listova se razlikuje u zavisnosti od njihovog položaja: gornji su duguljasti ili kopljasti, srednji su obrnuto jajasti i obuhvataju stablo, a donji su sa krilatom drškom. Cvetovi su sakupljeni u glavičaste, narandžastožute, krupne cvasti. Periferiju cvasti grade jezičasti cvetovi naslagani u 2-3 reda, a sredinu cevasti cvetovi. Omotač cvasti grade uzani, zeleni, lepljivi i dlakama pokriveni listići.

Annual, rarely biennial, ornamental plant, up to 50 cm tall. The marigold stem is upright, branched and furrowed and covered with short and stiff hairs. The shape of the leaves differs depending on their position: the upper ones are oblong or lanceolate, the middle ones are inverted ovate and enclose the stem, and the lower ones have a winged stem. The flowers are collected in large, orange-yellow heads. The periphery of the inflorescence is formed by tongue-shaped flowers arranged in 2-3 rows, and the middle by tubular flowers. The sheath of the inflorescence is made up of narrow, green, sticky and hairy leaflets.



Cichorium Intybus

Vodopija / *Chicory*

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 1

Polen / Pollen: 1

Vodopija (eng. Chicory)

Višegodišnja zeljasta biljka, visoka od 30 do 120cm. Stabljika je uspravna, kruta, uglasta, gola ili često dlakava, u gornjem delu granata. Listovi su duguljasti do lancetasti, suženi u dršku, duboko režnjevito testerasto usečeni. Cvetovi su svetloplavi, skupljeni u glavice koje izbijaju pojedinačno na stabljici ili granama, ima ih u velikom broju.

Perennial herbaceous plant, 30 to 120 cm tall. The stem is upright, rigid, angular, bare or often hairy, in the upper part of the shell. The leaves are oblong to lanceolate, narrowed in the stem, deeply lobed and saw-cut. The flowers are light blue, collected in heads that emerge individually on the stem or branches, there are a large number of them.



Carduus Acanthoides

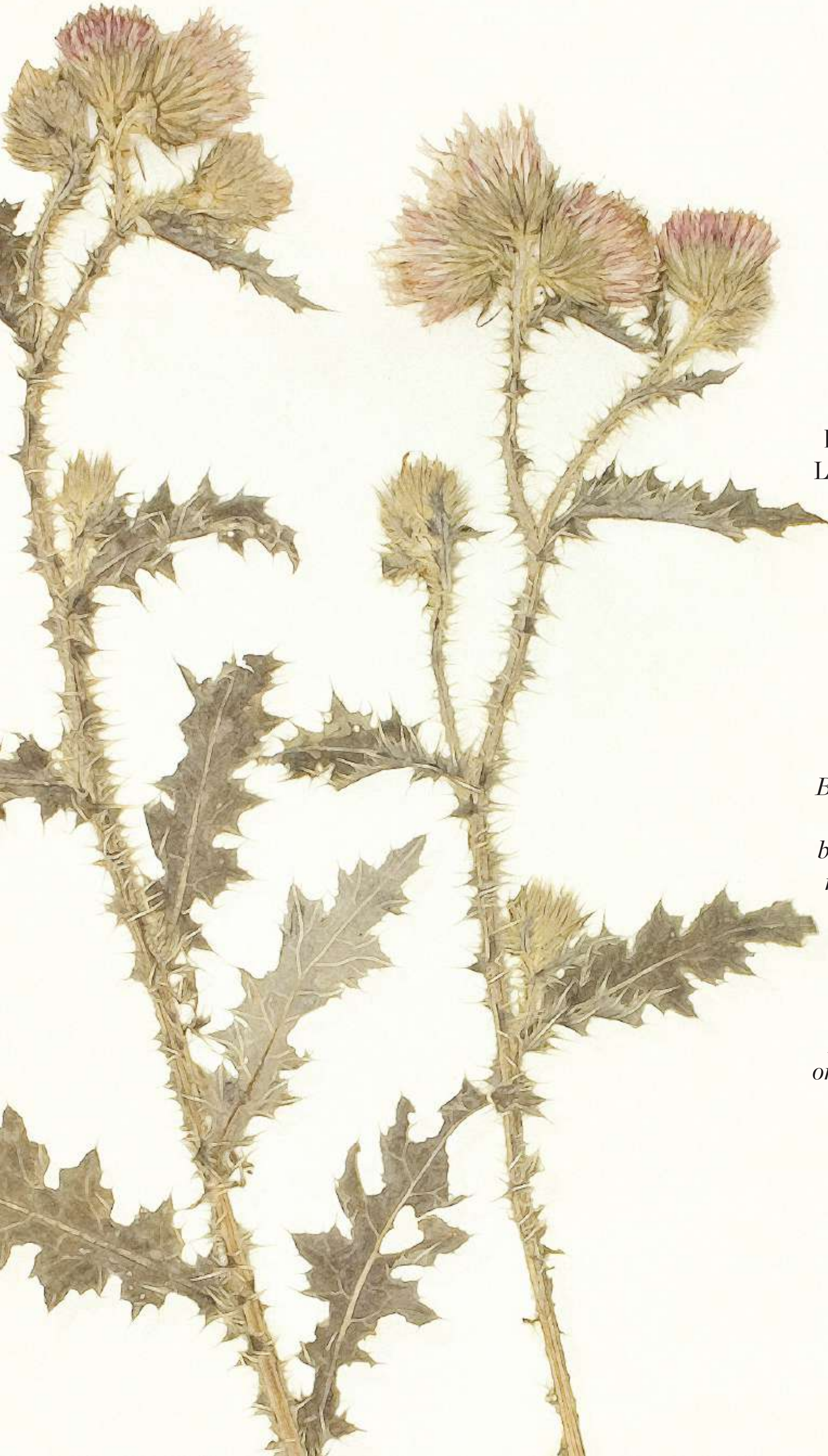
Bodalj / Spiny Plumeless Thistle

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 3



Bodalj (eng. Spiny Plumeless Thistle)

Dvogodišnja zeljasta biljka visoka do 2 m. Stabljika je uspravna, u gornjem delu razgranata sa uskim, kovrdžavo-bodljastim krilima. Listovi su duguljasto lancetasti, perasto režnjeviti. Režnjevi su šiljati, sa bodljastim zupcima i trepljama. Cvetovi su svetlopurpurnocrveni, vrlo retko beli ili žućkasti, u pojedinačnim glavicama na vrhovima grančica, ili u slabim gronjastim cvastima.

Biennial herbaceous plant up to 2 m high. The stem is upright, branched in the upper part with narrow, curly-spiny wings. The leaves are oblong-lanceolate, pinnately lobed. The lobes are pointed, with barbed teeth and cilia. The flowers are light purplish-red, very rarely white or yellowish, in individual heads at the tips of the twigs, or in weak racemose inflorescences.

Achillea Millefolium

Hajdučka trava / Yarrow

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep/Oct

Nektar / Nectar: 0

Polen / Pollen: 3

Hajdučka trava (eng. Yarrow)

Višegodišnja zeljasta biljka visoka do 80cm. Stabljika je uspravna, pri vrhu razgranata. Listovi su dugački, fino kitnjasto deljeni. Cvetovi su sitni beli,retko ružičasti složeni u štitastu mirišljavu cvast na vrhu.

Perennial herbaceous plant up to 80 cm tall. The stem is upright, branched at the top. The leaves are long, finely ornately divided. The flowers are small white, rarely pink arranged in a shield-shaped fragrant inflorescence at the top.



Asclepias Syriaca

Cigansko perje / Milkweed

Vreme cvetanja / **Flowering Time:**

Jun/Jul/Aug

Nektar / **Nectar:** 4

Polen / **Pollen:** 3



Cigansko perje (eng. Milkweed)

Višegodišnja zeljasta biljka, čija visina može biti i preko 2m. Stabljika je uspravna, jednostavna ili malo granata. Listovi su debeli mesnati, izduženo eliptični na vrhu kratko zašiljeni na kratkim lisnim drškama. Cvetovi su bledoružičasti, sitni po 50-60 skupljeni u štitaste cvasti.

Perennial herbaceous plant, the height of which can be over 2 m. The stem is erect, simple or with few branches. The leaves are thick fleshy, elongated elliptic at the top, shortly pointed on short petioles. The flowers are pale pink, small, 50-60 gathered in shield inflorescences.

Ballota Nigra

Crna kopriva / Black Horehound

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

Nektar / Nectar: 3

Polen / Pollen: 1



*C*rna kopriva (eng. *B*lack *H*orehound)

Višegodišnja zeljasta korovska biljka, visoka do 1 m sa nekoliko razgranatih stabljika. Listovi su trouglasto jajasti, naborani po obodu testerasti na naličiju dlakavi. Cvetovi su crveno-ljubičasti po 4 do 10 složeni u prividne pršljenove u pazuhu listova.

Perennial herbaceous weed plant, up to 1 m tall with several branched stems. The leaves are triangular-ovate, wrinkled on the edge, saw-toothed and hairy on the face. The flowers are red-purple, 4 to 10 arranged in apparent spines in the axils of the leaves.

Mentha Longifolia

Konjski bosiljak / Horse Mint

Vreme cvetanja / Flowering Time:

Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 1



Konjski bosiljak (eng. Horse Mint)

Višegodišnja zeljasta aromatična biljka visoka između 30 i 100 cm. Stabljike su uspravne, razgranate ili skoro jednostavne, obično oštro četvorougle, beličaste, gusto pokrivene kratkim, mesnatim dlakama. Listovi su sedeći na kratkim drškama, liske jajasto izdužene, izduženo lancetaste ili lancetaste. Cvetovi su sakupljeni u prividne pršljenove, koji su na krajevima stabljika i grana približeni i grupisani u guste, bezlisne, klasasto cilindrične i na vrhu sužene cvasti.

Perennial herbaceous aromatic plant between 30 and 100 cm tall. Stems are erect, branched or almost simple, usually sharply quadrangular, whitish, densely covered with short, fleshy hairs. Leaves are sessile on short petioles, bracts ovate-oblong, oblong-lanceolate or lanceolate. The flowers are collected in apparent spines, which are brought together at the ends of the stems and branches and grouped into dense, leafless, spike-cylindrical inflorescences narrowed at the top.

Cirsium Canum

Pseća palamida / Plume Thistles

Vreme cvetanja / Flowering Time:

Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 4

Pseća palamida (eng. Plume Thistles)

Višegodišnja zeljasta biljka visoka između 30 i 150cm. Stabljika je uspravna, jednostavna sa dugačkim grančicama do sredine sa listovima. Listovi su duguljasti do lancetasti, nedeljeni ili lučno nazubljeni. Cvetovi su purpurni, vrlo retko beli, u pojedinačnim glavičastim cvastima.

Perennial herb between 30 and 150 cm tall. The stem is upright, simple with long branches up to the middle with leaves. The leaves are oblong to lanceolate, undivided or arched. The flowers are purple, very rarely white, in individual heads.



Fagopyrum Esculentum

Heljda / Buckwheat

Vreme cvetanja / Flowering Time:

Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 4



*H*ELJDA (ENG. *B*UCKWHEAT)

Žitarica sa stabljikom visine od 30 do150 cm, rebrasta, razgranata, kad sazri crvena, listovi su srcoliki. Plod je oraščić.

Cereal with a stem height of 30 to 150 cm, ribbed, branched, red when ripe, heart-shaped leaves. The fruit is a nut.

Phacelia Tanacetifolia

Facelija / Lacy Phacelia

Vreme cvetanja / Flowering Time:

Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 4

Facelija (eng. Lacy Phacelia)

Jednogodišnja biljka visine od 60 do 90 cm. Grana se u donjem delu stabljike. Na svakoj grani nalazimo grančice koje nose sitne cvetove. Latice su u gornjem delu ljubičaste, a pri dnu prelaze u belu boju. Jedna biljka sadrži od 5 000 – 7 000 cvetića. Na mestu cvetova stvara se plod u obliku čaure koji sadrži semenke.

An annual plant with a height of 60 to 90 cm. It branches in the lower part of the stem. On each branch we find twigs that bear small flowers. The petals are purple in the upper part, and turn white at the bottom. One plant contains from 5,000 to 7,000 flowers. In the place of flowers, a pod-shaped fruit containing seeds is formed.



Aster Tripolium

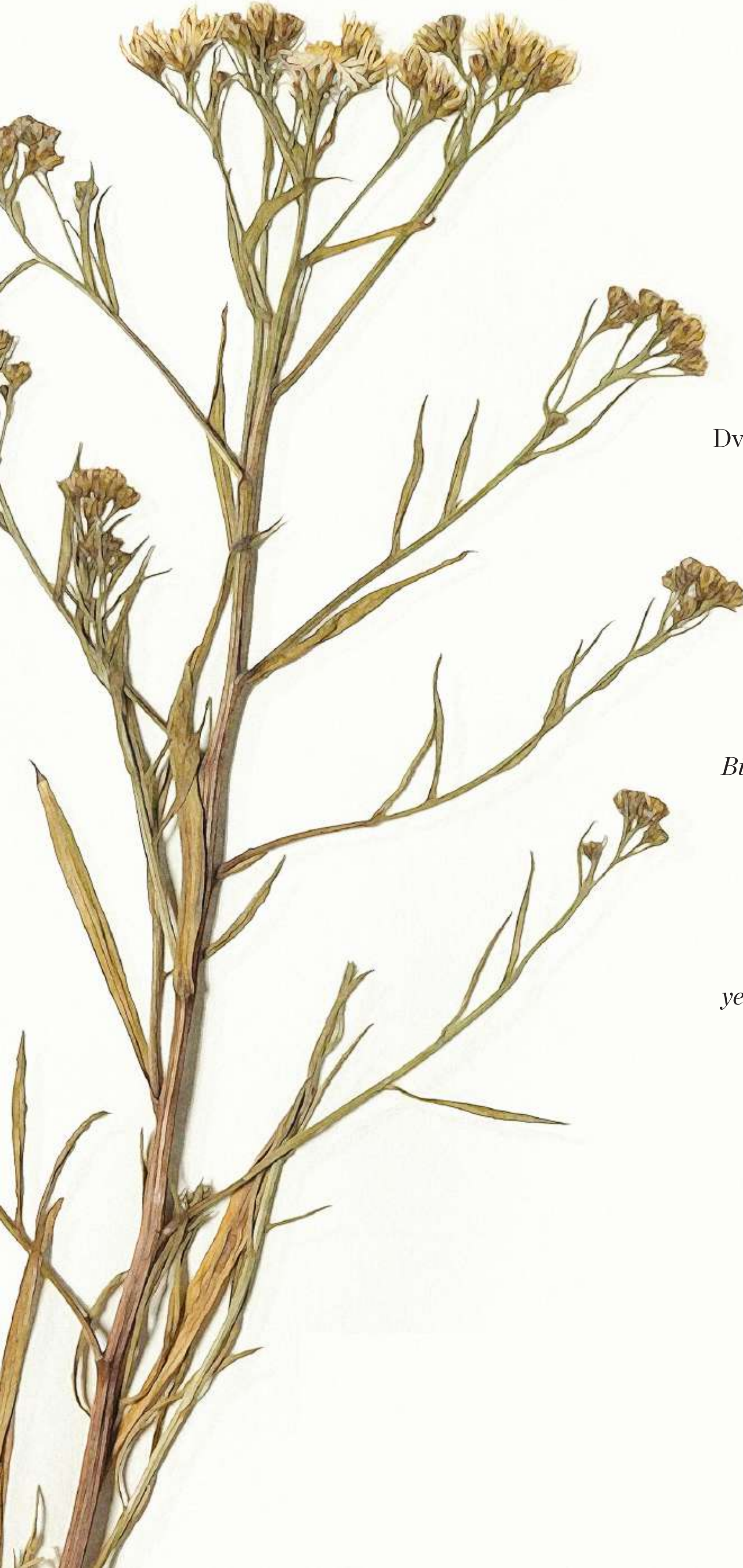
Aster / Sea Aster

Vreme cvetanja / Flowering Time:

Jul/Aug/Sep/Oct

Nektar / Nectar: 3

Polen / Pollen: 3



Aster (eng. Sea Aster)

Dvogodišnja zeljasta biljka visoka između 15 i 100 cm. Stabljika je uspravna, gola, često crvenkasta, pri osnovi granata. Listovi su malo mesnati, goli, po obodu slabo nazubljeni. Cvetnih glavica ima mnogo u razređenoj gronjastoj cvasti. Središnji cvetovi su žućkastonarandžasti, a obodni ljubičasti ili svetloplavi, retko beli.

Biennial herb between 15 and 100 cm tall. The stem is upright, bare, often reddish, at the base of the pomegranate. The leaves are slightly fleshy, bare, slightly toothed around the edges. There are a lot of flower heads in a thin, paniculate inflorescence. The central flowers are yellowish-orange, and the peripheral ones are purple or light blue, rarely white.

Dipsacus Laciniatus

Vodostanj visoki / Cutleaf Teasel

Vreme cvetanja / Flowering Time:

Jul/Aug

Nektar / Nectar: 3

Polen / Pollen: 4



Vodostanj visoki (eng. Cutleaf Teasel)

Dvogodišnja zeljasta biljka, koja na vlažnim zemljištima dostiže visinu preko 2m. Stabljika je uspravna,uglasta izbrazdana, duž uglova pokrivena bodljama u gornjem delu granata. Listovi stabljike su izduženo lancetasti, sedeći , naspramni medjusobno srasli na vrhu šiljati. Prizemni listovi su obrnuto jajasti nazubljeni ili perasto izdeljeni obrazuju rozetu. Cvetovi su beli redje svetlo crvenkasti, zbijeni u jajaste glavičaste cvasti, na vrhu stabljike ili grana.

A biennial herbaceous plant, which reaches a height of over 2m on wet soils. The stem is upright, angularly furrowed, along the corners covered with spines in the upper part of the shell. The leaves of the stem are elongated lanceolate, sessile, opposite, fused to each other at the pointed tip. Ground leaves are inverted ovate toothed or pinnately divided forming a rosette. The flowers are white, rarely bright red, clustered in egg-shaped inflorescences, at the top of the stem or branches.

Menta Arvensis

Poljska nana / Corn Mint

Vreme cvetanja / Flowering Time:

Jul/Aug/Sep

Nektar / Nectar: 4

Polen / Pollen: 1



Poljska nana (eng. Corn Mint)

Višegodišnja zeljasta biljka visoka između 15 i 50 cm. Stabljika je razgranata i maljava ponekad crvenkaste boje. Listovi su naspramni jajasti do izduženo jajasti na kratkim drškama na vrhu ušiljeni, pri osnovi srcasti ili klinasti. Cvetovi su bledoljubičasti ili ružičasto-ljubičasti grupisani u mnogocvetne loptaste pršljenove u pazuhu listova.

Perennial herb between 15 and 50 cm tall. The stem is branched and sometimes reddish in color. The leaves are oppositely ovate to elongated ovate on short petioles, pointed at the top, heart-shaped or wedge-shaped at the base. The flowers are pale purple or pinkish-purple grouped in many-flowered globular spines in the axils of the leaves.

Daucus Carota

Divlja šargarepa / Wild Carrot

Vreme cvetanja / Flowering Time:

Jun/Jul/Aug/Sep

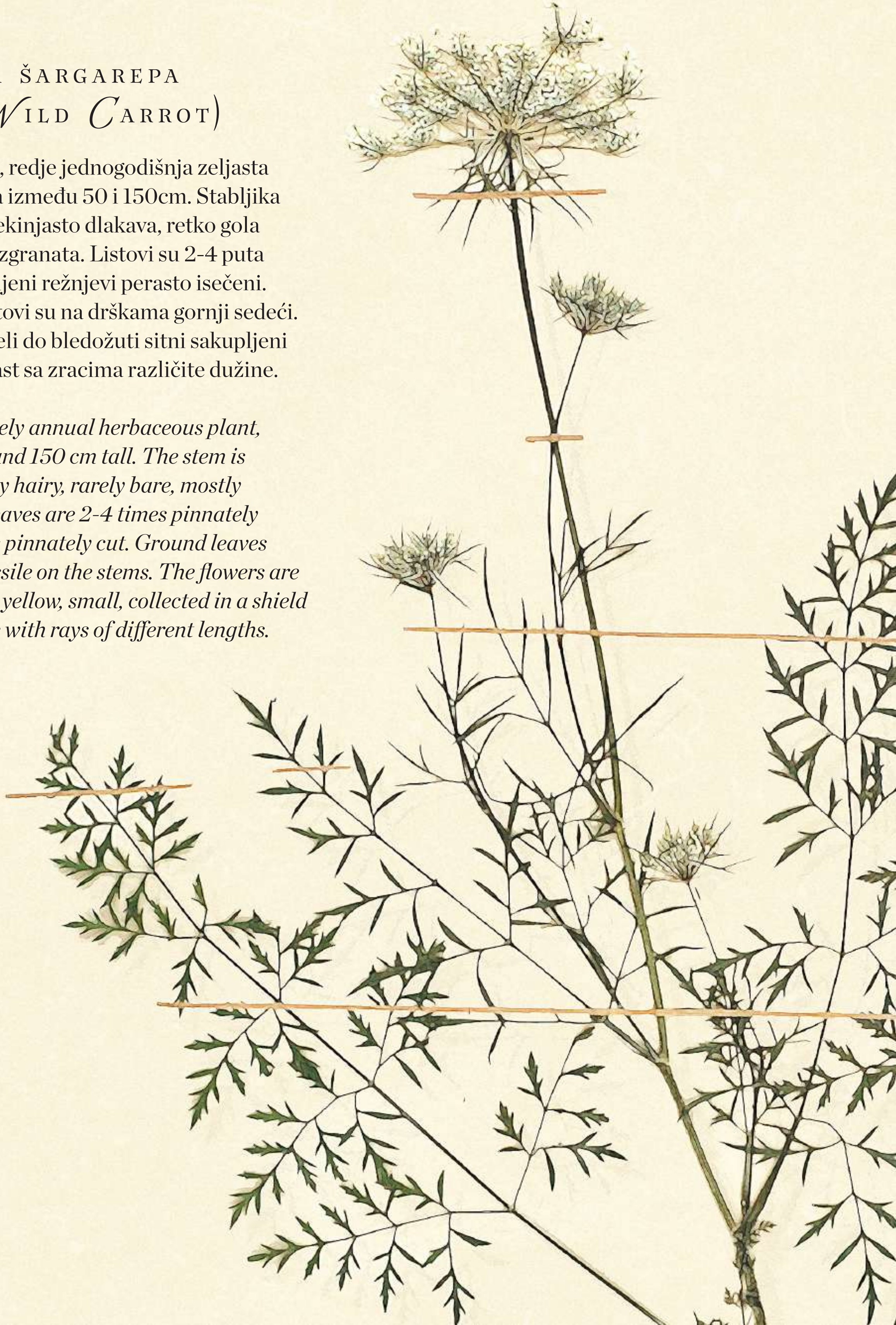
Nektar / Nectar: 3

Polen / Pollen: 3

Divlja šargarepa (eng. Wild Carrot)

Dvogodišnja, redje jednogodišnja zeljasta biljka, visoka između 50 i 150cm. Stabljika je rebrasta čekinjasto dlakava, retko gola uglavnom razgranata. Listovi su 2-4 puta perasto izdeljeni režnjevi perasto isečeni. Prizemni listovi su na drškama gornji sedeći. Cvetovi su beli do bledožuti sitni sakupljeni u štitastu cvast sa zracima različite dužine.

Biennial, rarely annual herbaceous plant, between 50 and 150 cm tall. The stem is ribbed, bristly hairy, rarely bare, mostly branched. Leaves are 2-4 times pinnately divided lobes pinnately cut. Ground leaves are upper sessile on the stems. The flowers are white to pale yellow, small, collected in a shield inflorescence with rays of different lengths.



Calluna Vulgaris

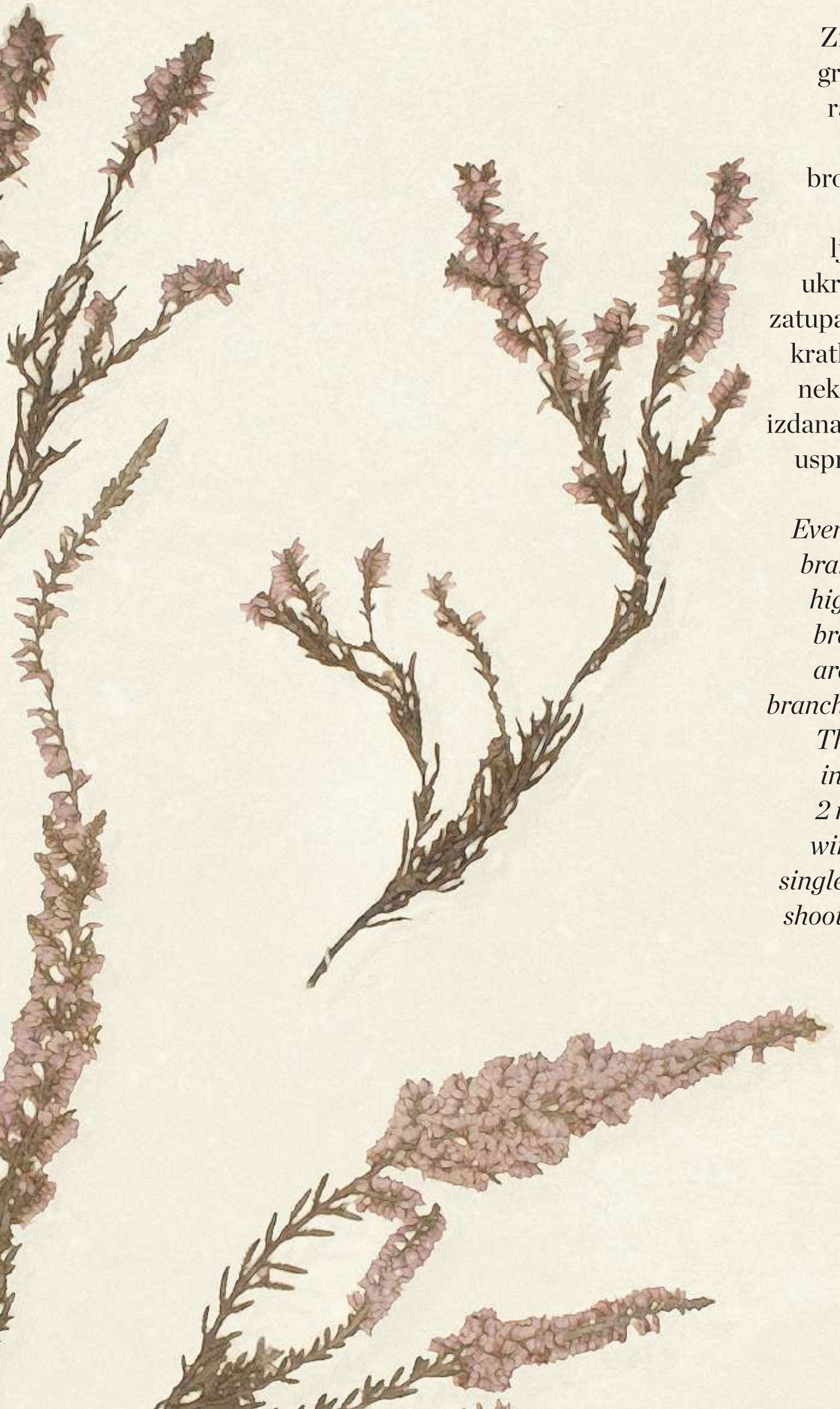
*V*RESAK / *H*EATHER

Vreme cvetanja / Flowering Time:

Aug/Sep

Nektar / Nectar: 4

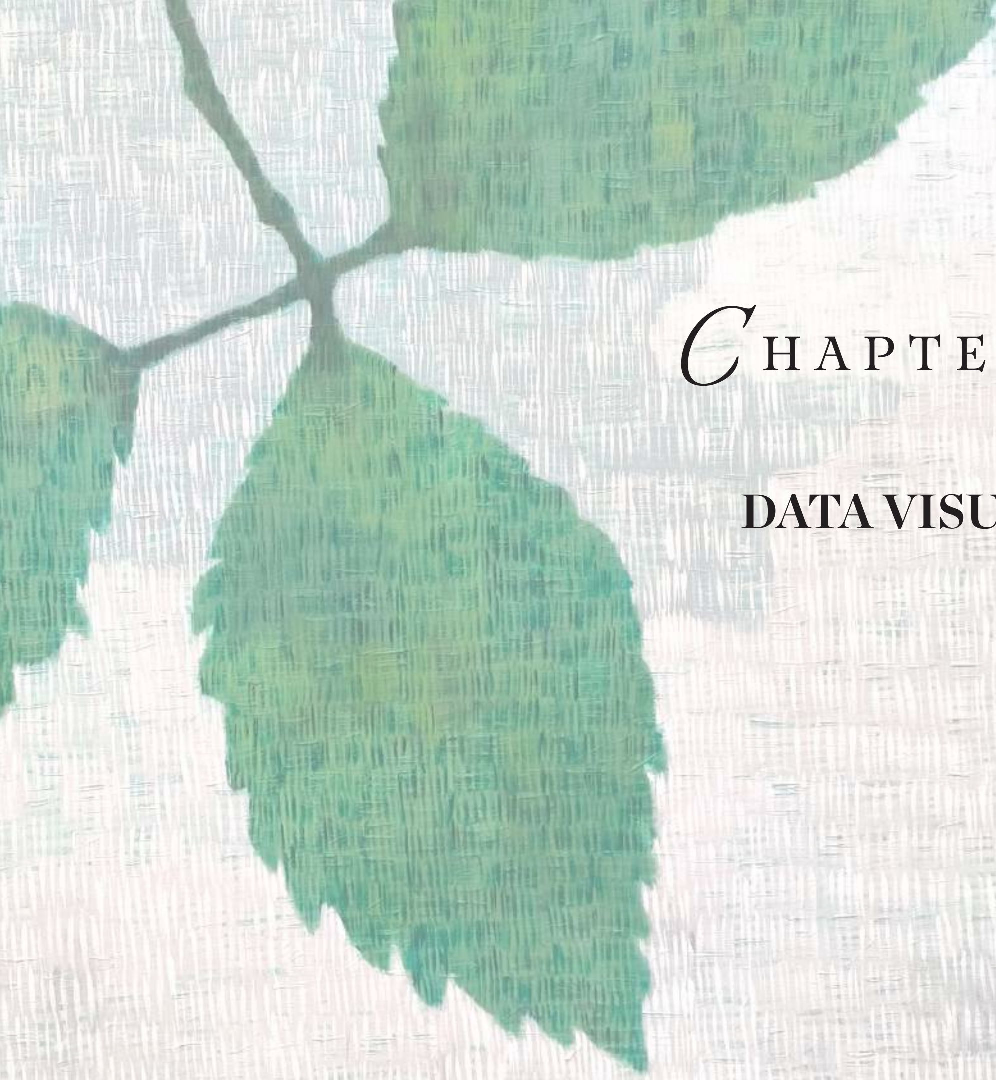
Polen / Pollen: 4



Vresak (eng. Heather)

Zimzeleni, polegli ili ustajući, gusto granati žbun, visok do 1 m. Ima jako razvijen korenov sistem, a grane su lako lomljive. Pupoljci su sitni, sa brojnim ljuspama. Grančice su gusto pokrivene lišćem. Listovi su sitni, ljuspasti, raspoređeni u četiri reda, ukršteno naspramno, dugi oko 2 mm, zatupasti, goli, zimi smeđi. Cvetovi su sa kratkim peteljkama, pojedinačni ili po nekoliko na krajevima kratkih bočnih izdanaka, u gustim grozdastim, lisnatim, uspravnim cvastima, dugim do 25 cm.

Evergreen, decumbent or erect, densely branched shrub, up to 1 m tall. It has a highly developed root system, and the branches are easily broken. The buds are small, with numerous scales. The branches are densely covered with leaves. The leaves are small, scaly, arranged in four rows, crossed opposite, about 2 mm long, blunt, glabrous, brown in winter. The flowers are short-stalked, single or several at the ends of short side shoots, in dense clustered, leafy, upright inflorescences, up to 25 cm long.



Chapter Two

DATA VISUALIZATION

Data Visualization

The Bee-Sustain application collects data from ten locations on the territory of the Republic of Serbia: Grdelica, Vlasina, Niš, Pirot, Donje Suhotno, Merošina, Bor, Žitorađa, Sokobanja and Lapovo. Using the collected data on temperature, humidity and data on the amount of nectar and pollen presented in the first chapter, the application predicts the total amount of honey income.
Based on the diagrammatic representations of annual plant flowering activities, it can be seen that the periods from January to March and from July to December are marked by a significantly reduced yield of nectar and pollen. In contrast, the months of April, May and June stand out as the most intense in terms of flowering and production of these important resources for bees.

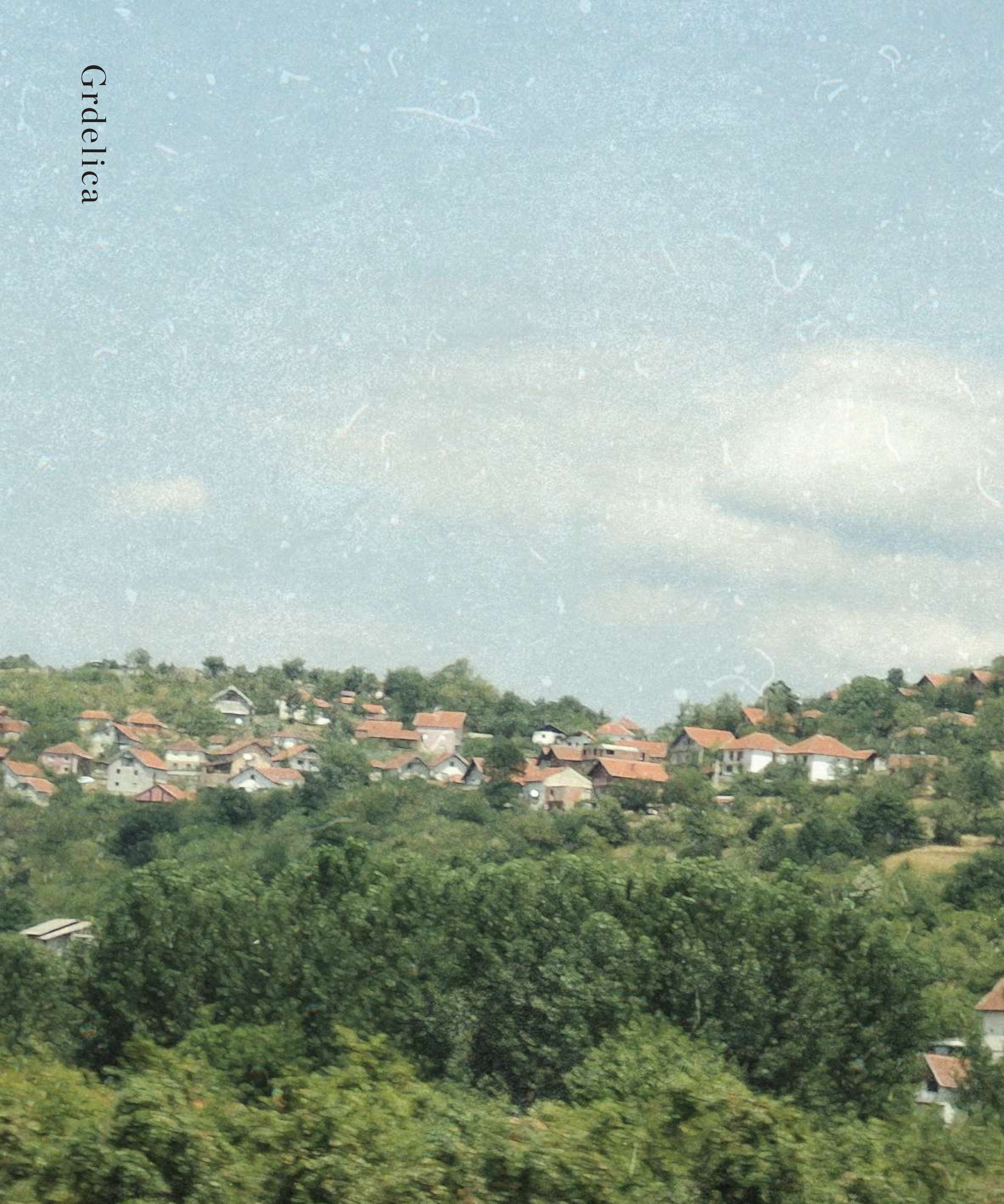
The diagrams show the comparative amounts of nectar (in blue) and pollen (in red) that certain plants provide during their flowering period. Based on these data, we can recognize which plants are the most useful for bees and in which period. A plant that offers only one type of resource cannot fully satisfy the needs of the bee colony. The combination of nectar and pollen allows bees to survive, develop and produce honey.

Vizualizacija Podataka

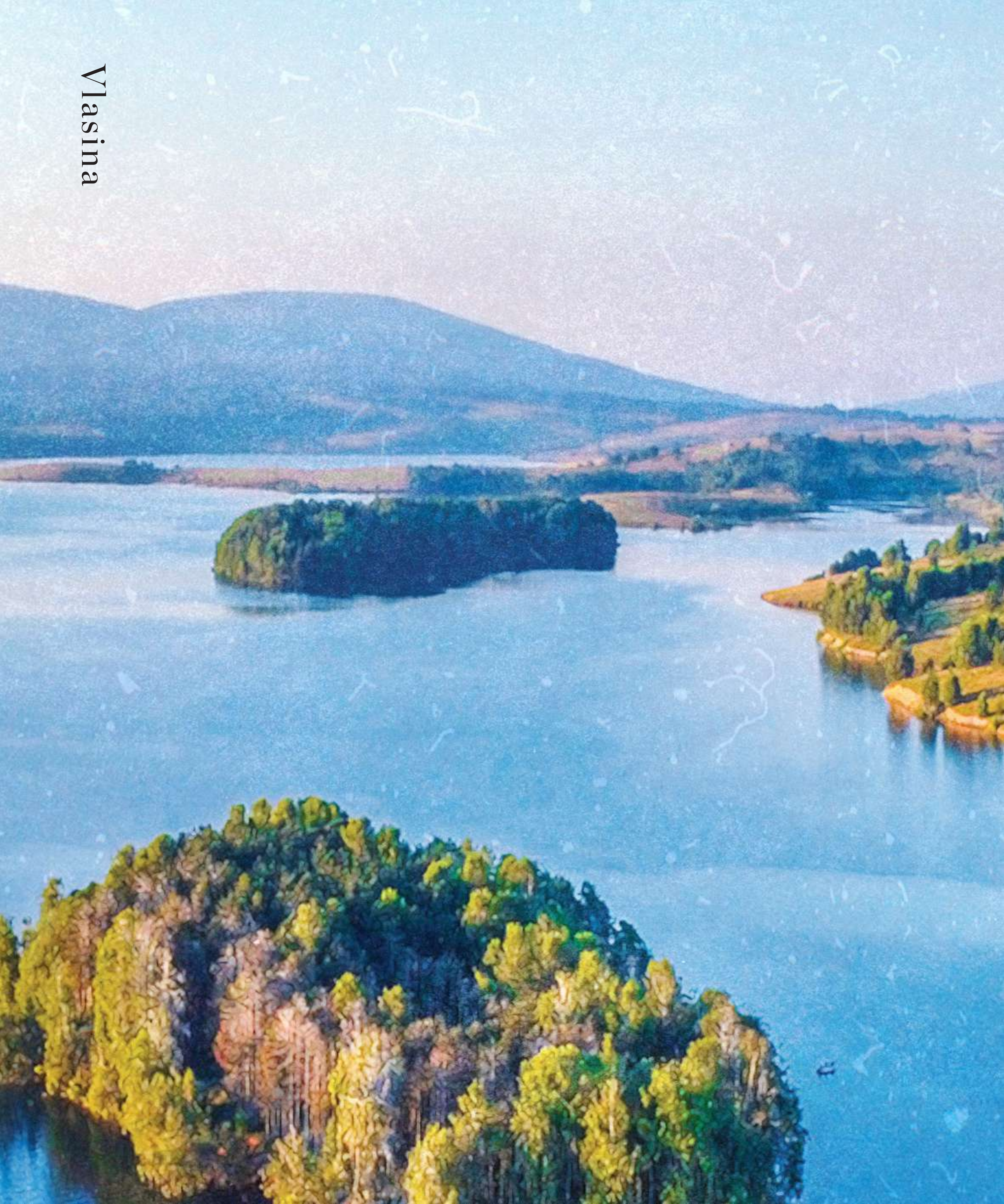
Bee-Sustain aplikacija prikuplja podatke sa deset lokacija na teritoriji Republike Srbije: Grdelica, Vlasina, Niš, Pirot, Donje Suhotno, Merošina, Bor, Žitorađa, Sokobanja i Lapovo. Koristeći prikupljene podatke o temperaturi, vlažnosti i podatke o količini nektara i polena predstavljenih u prvom poglavlju aplikacija predviđa ukupnu količinu medonosnog prihoda.

Na osnovu dijagramskih prikaza godišnjih aktivnosti cvetanja biljaka, može se uočiti da su periodi od januara do marta i od jula do decembra obeleženi značajno smanjenim prinosom nektara i polena. Nasuprot tome, meseci april, maj i jun izdvajaju se kao najintenzivniji u pogledu cvetanja i proizvodnje ovih važnih resursa za pčele.

Dijagrami prikazuju uporedne količine nektara (plavom bojom) i polena (crvenom bojom) koje pojedine biljke obezbeđuju tokom perioda svoga cvetanja. Na osnovu tih podataka možemo da prepoznamo koje biljke su najkorisnije za pčela i u kom periodu. Biljka koja nudi samo jednu vrstu resursa ne može u potpunosti zadovoljiti potrebe pčelinje zajednice. Kombinacija nektara i polena omogućavaju pčelama da prežive, da se razvijaju i proizvode med.



Grdelica

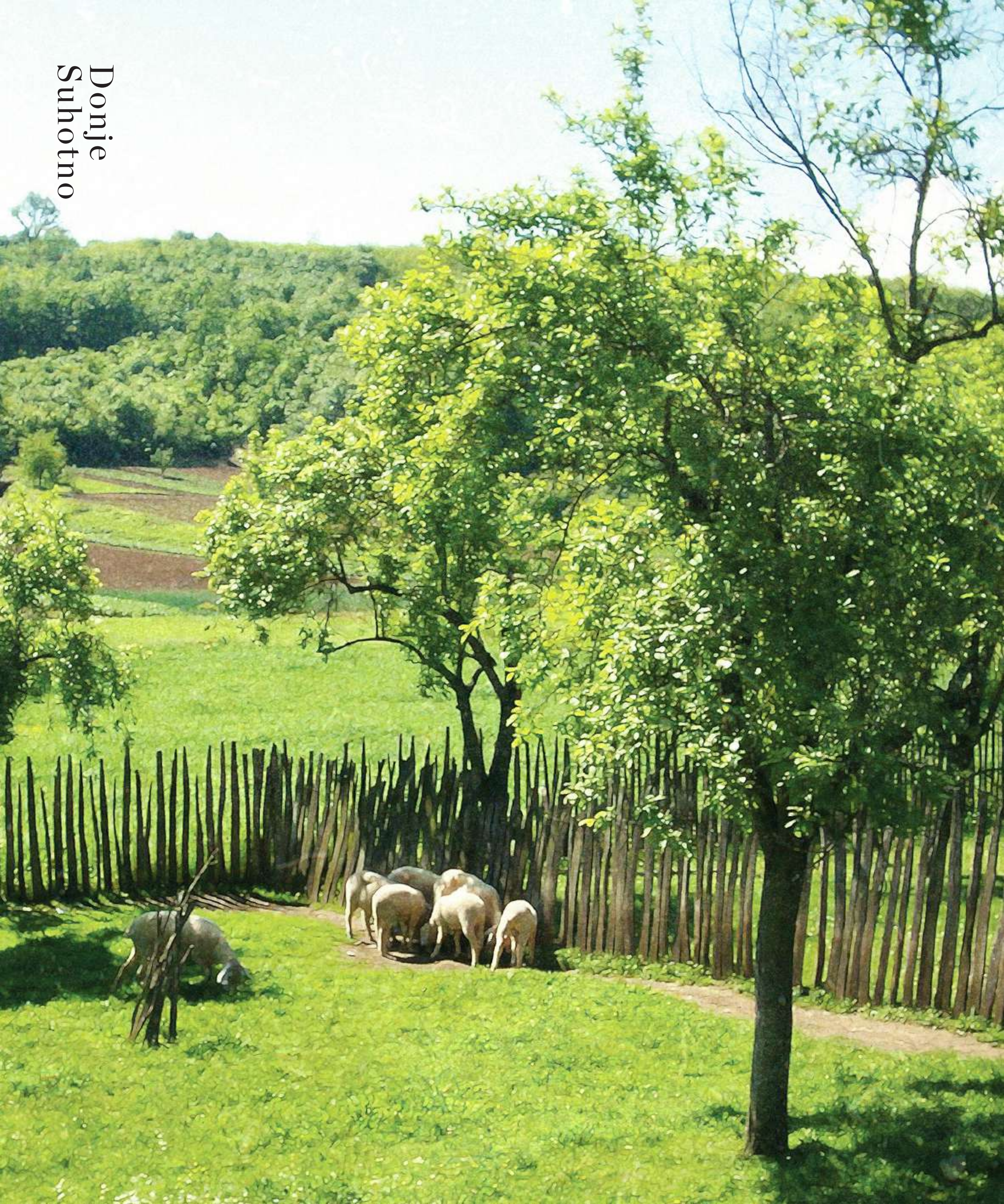

Vlasina

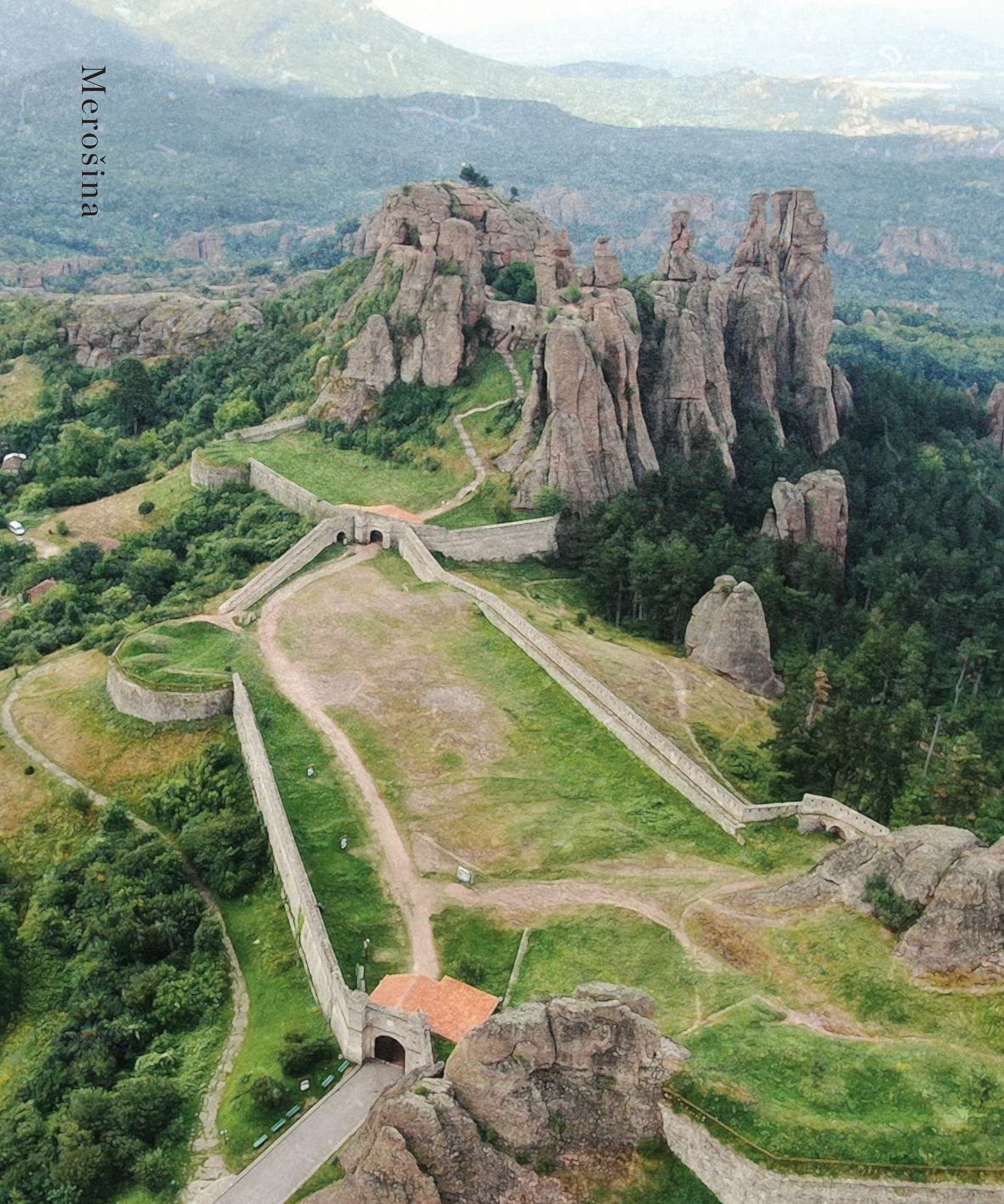

Niš



Pirot

Donje
Suhotno

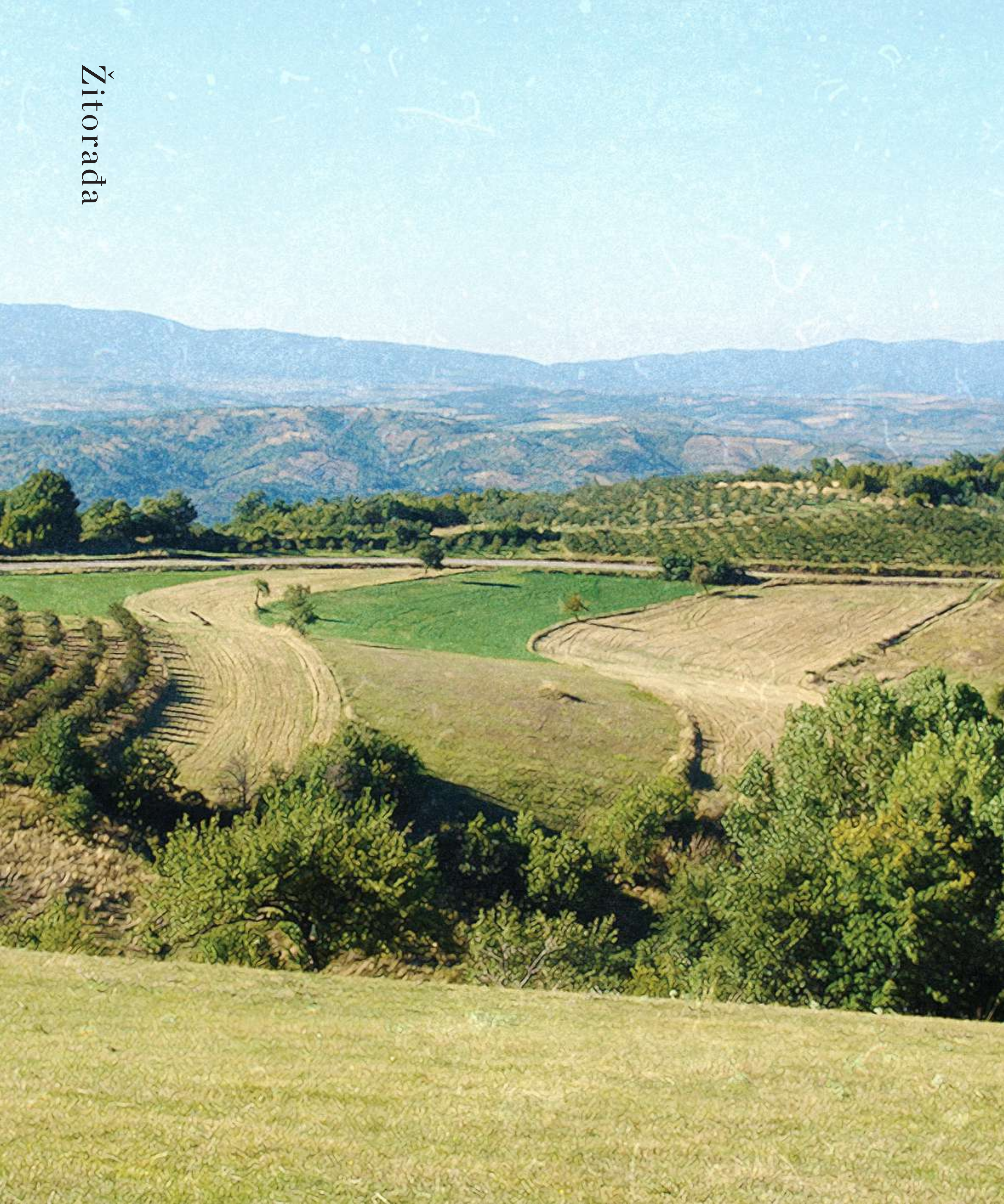


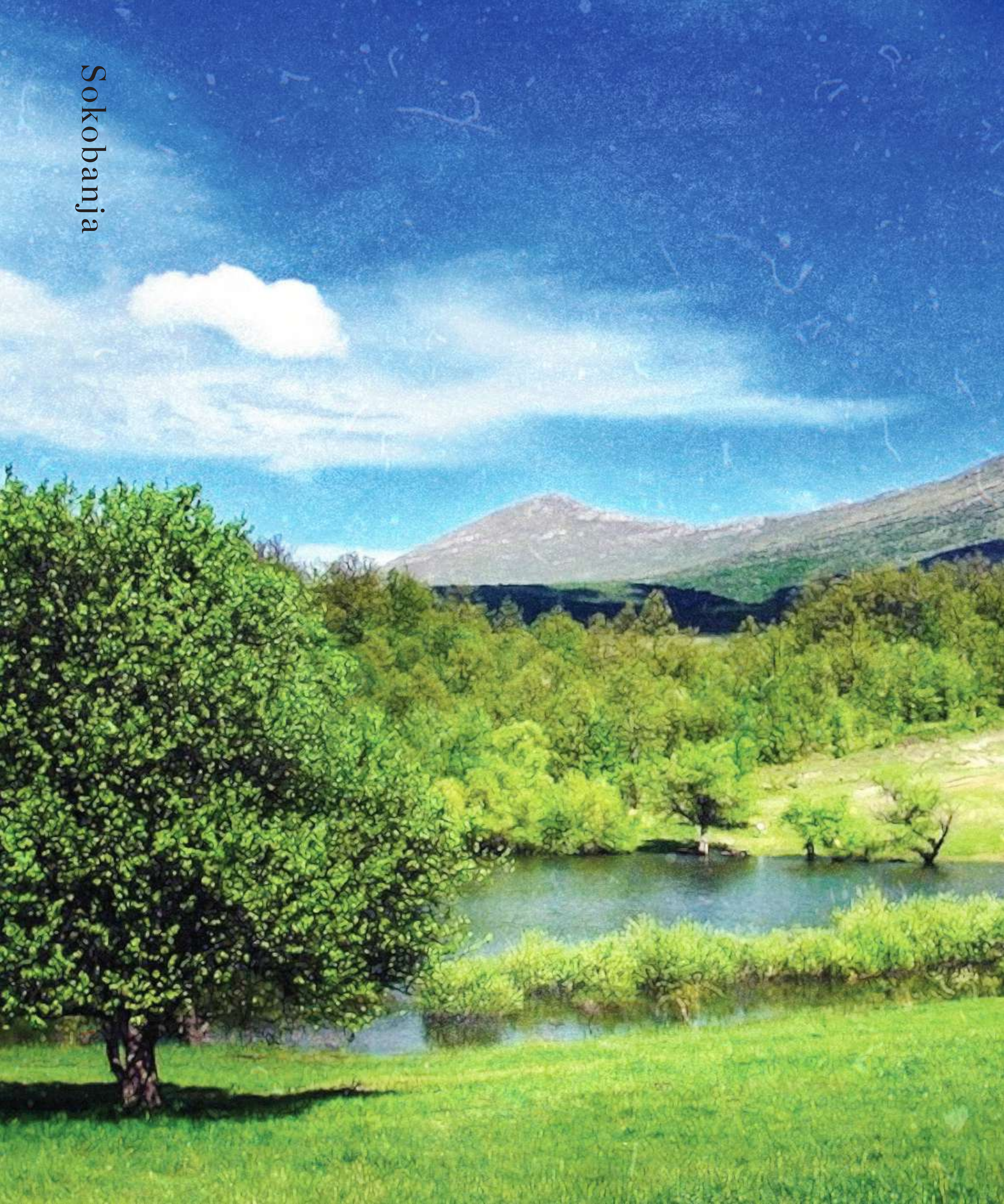


Merošina


Bor

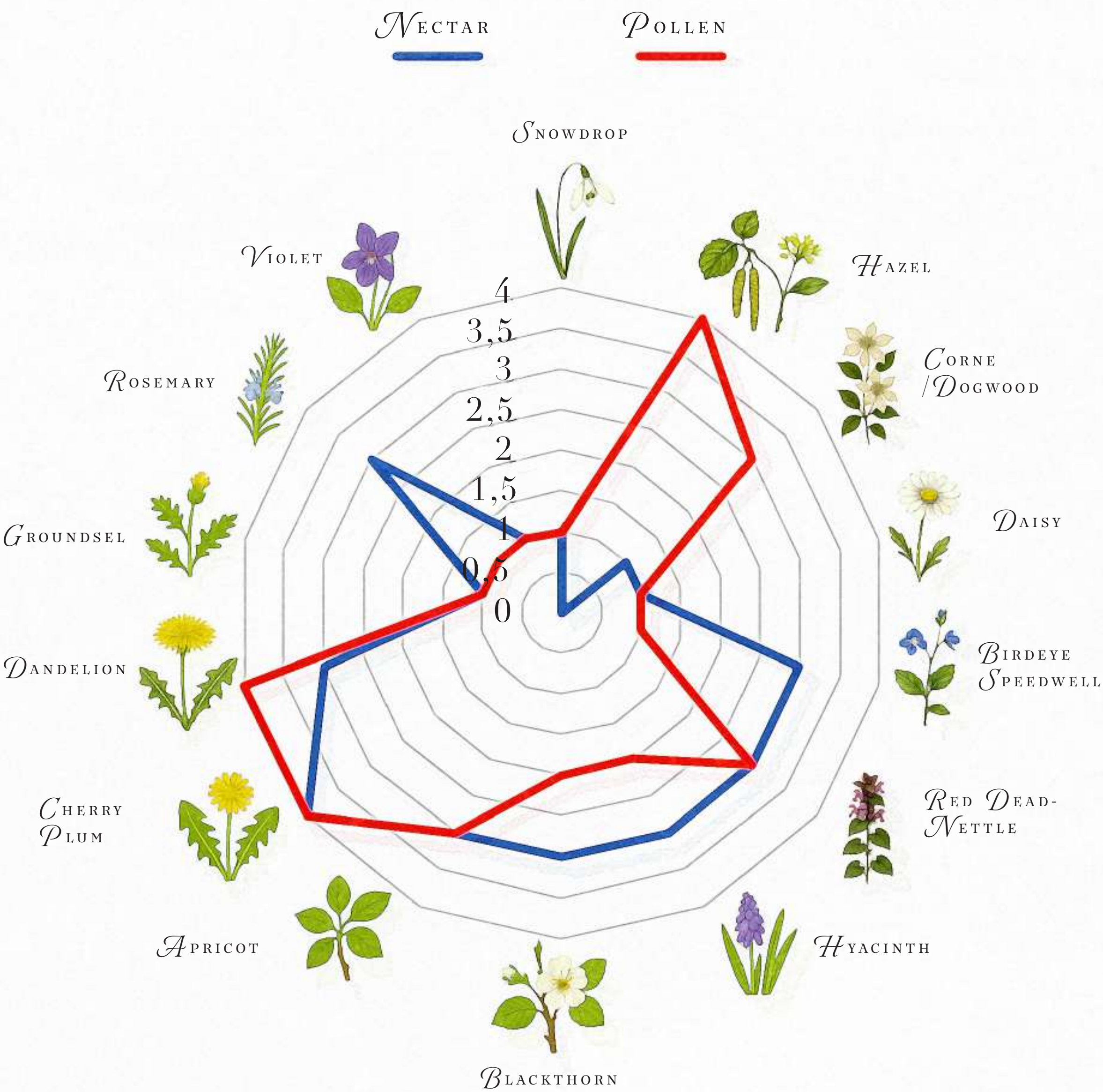
Žitorada




Sokobanja

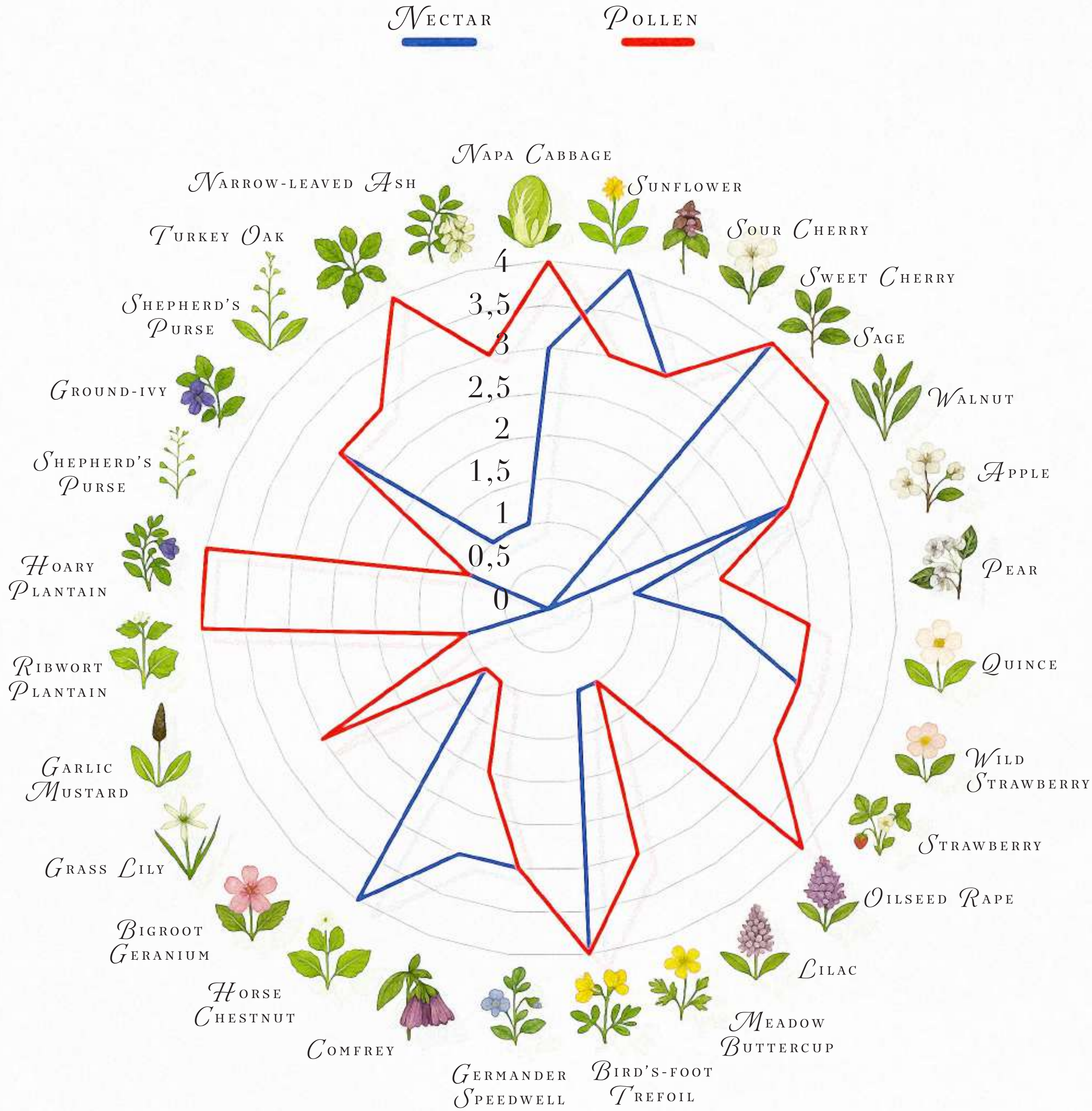

Lapovo

Jan - Mar

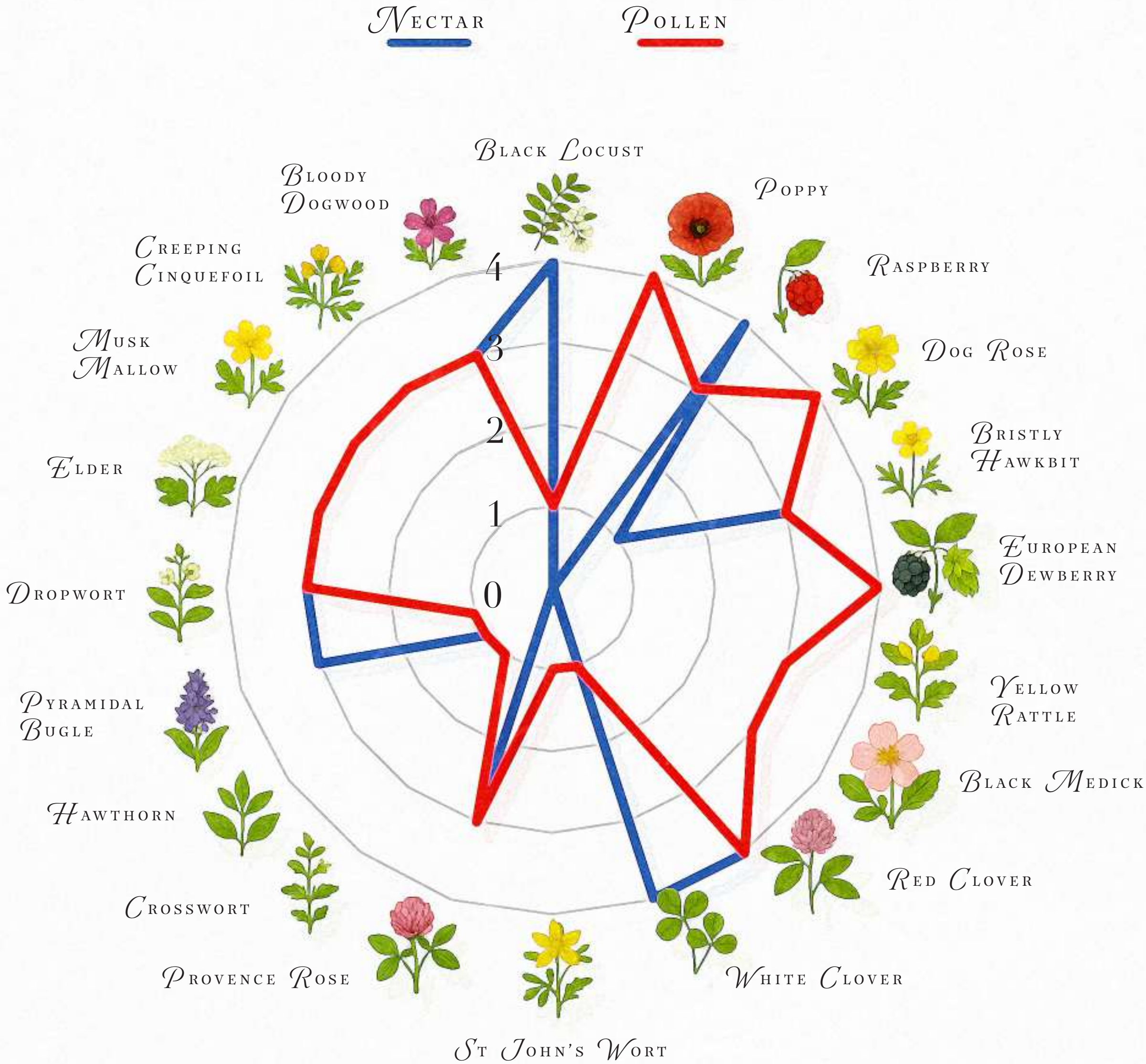


Nectar
Pollen
Snowdrop
Hazel
Corne /Dogwood
Daisy
Birdeye Speedwell
Red Dead-Nettle
Hyacinth
Blackthorn
Apricot
Cherry Plum
Dandelion
Groundsel
Rosemary
Violet
4
3,5
3
2,5
2
1,5
1
0,5
0

April

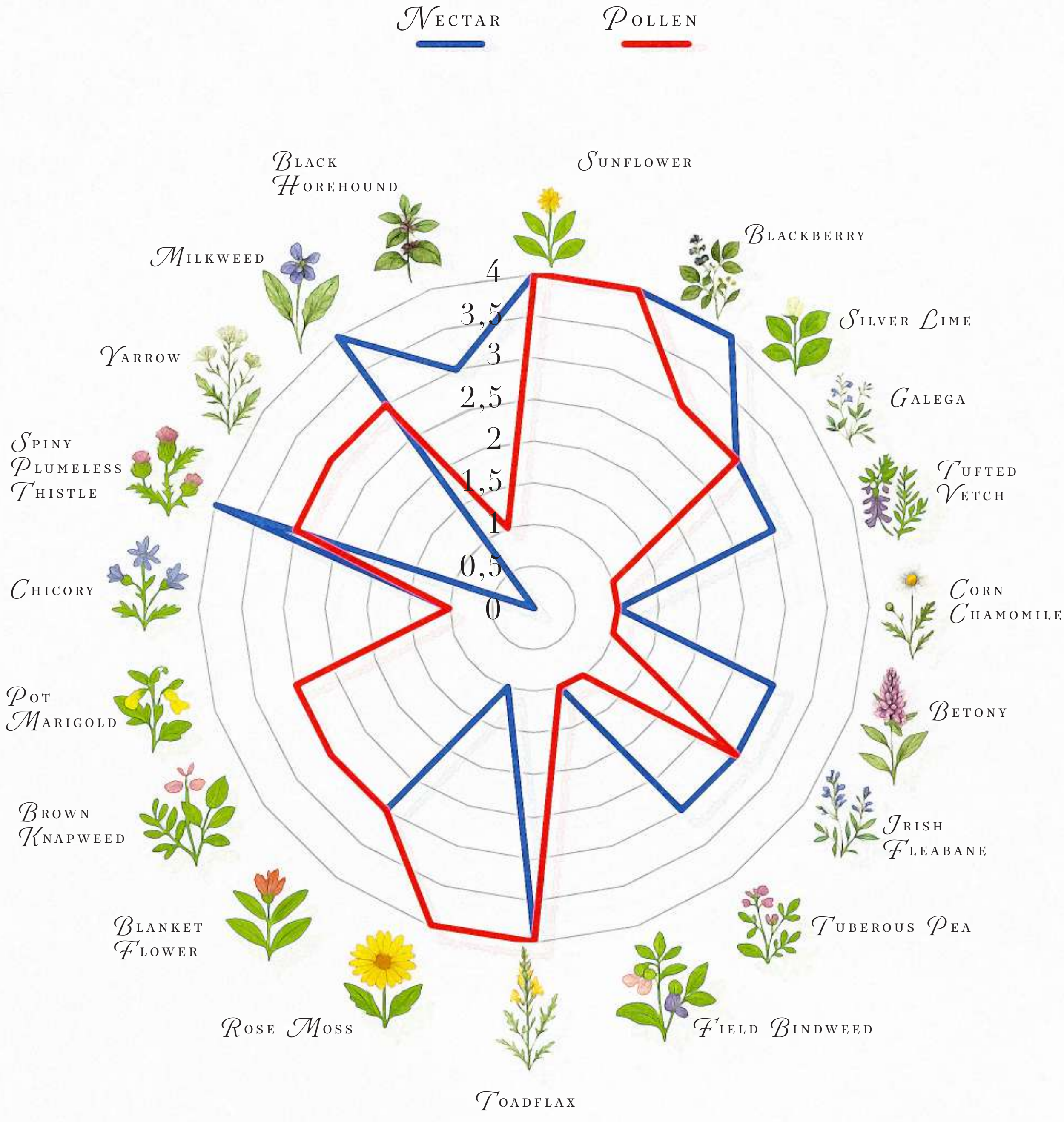

Nectar
Pollen
Napa Cabbage
Sunflower
Sour Cherry
Sweet Cherry
Sage
Walnut
Apple
Pear
Quince
Wild Strawberry
Strawberry
Oilseed Rape
Lilac
Meadow Buttercup
Bird's-foot Trefoil
Germander Speedwell
Comfrey
Horse Chestnut
Bigroot Geranium
Grass Lily
Garlic Mustard
Ribwort Plantain
Hoary Plantain
Shepherd's Purse
Ground-ivy
Shepherd's Purse
Turkey Oak
Narrow-leaved Ash
4
3,5
3
2,5
2
1,5
1
0,5
0

Maj



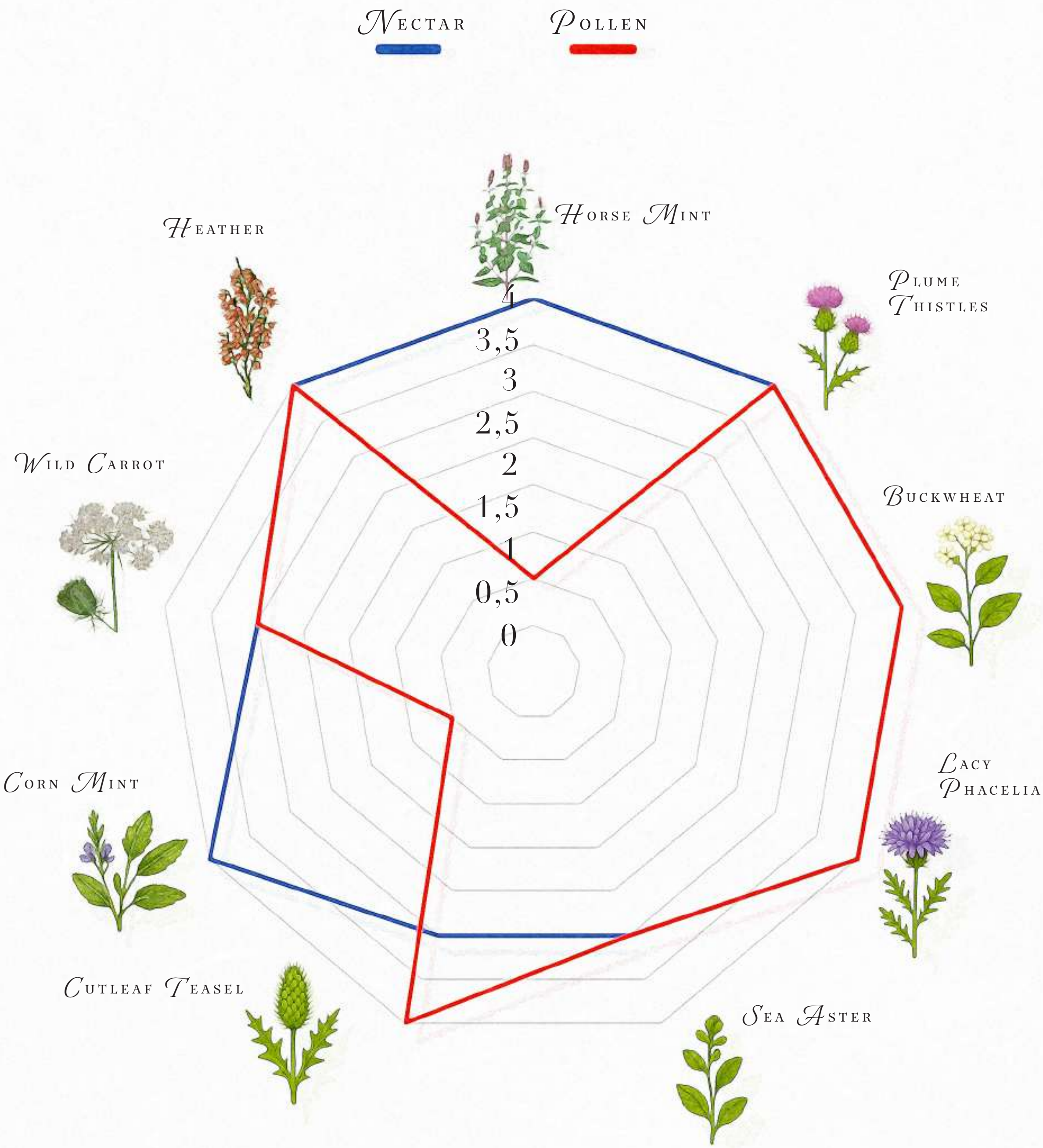
Nectar
Pollen
Black Locust
Poppy
Raspberry
Dog Rose
Bristly Hawkbit
European Dewberry
Yellow Rattle
Black Medick
Red Clover
White Clover
St John's Wort
Provence Rose
Crosswort
Hawthorn
Pyramidal Bugle
Dropwort
Elder
Musk Mallow
Creeping Cinquefoil
Bloody Dogwood
4
3
2
1
0

Jun



Nectar
Pollen
Sunflower
Blackberry
Silver Lime
Galega
Tufted Vetch
Corn Chamomile
Betony
Irish Fleabane
Tuberous Pea
Field Bindweed
Toadflax
Rose Moss
Blanket Flower
Brown Knapweed
Pot Marigold
Chicory
Spiny Plumeless Thistle
Yarrow
Milkweed
Black Horehound
4
3,5
3
2,5
2
1,5
1
0,5
0

Jul - Dec


Nectar
Pollen
Horse Mint
Plume Thistles
Buckwheat
Lacy Phacelia
Sea Aster
Cutleaf Teasel
Corn Mint
Wild Carrot
Heather
4
3,5
3
2,5
2
1,5
1
0,5
0

Chapter Three

FUTURE IMPLEMENTATION



Future Implementation

Bee-Sustain, an application based on artificial intelligence, was created as a response to increasingly pronounced climate changes, accelerated technological development and the increasingly weak connection between man and nature. The application uses artificial intelligence to monitor data from IoT devices and weather conditions and determine optimal locations for placing beehives, which directly affects the increase in honey yield and indirectly contributes to greater success in pollination of fruit and vegetable crops. It also monitors the condition of the hives themselves and analyzes micro-locations, providing users with detailed and personalized information that allows them to make the best decisions. Although in the initial phase it is focused on the territory of the Republic of Serbia, the methodology and vision of the project indicate its wider application — primarily at the European level.

In addition to technological sophistication, Bee-Sustain also connects different fields: science, nature and art. In order to make this connection clear, the project team decided to present the technology in the form of an art book called Honey Plants – Medonosne biljke, which will be equally accessible to beekeepers, but also to other users who recognize the invitation to participate in the book. In this context, the book becomes more than an informational tool—it is an artistic tool for climate and environmental literacy. Through poetic and visual language, he reminds the reader of the beauty and complexity of nature, but also of his responsibility.

Honey Plants – Medonosne biljke is not a classic herbarium, but a living book — a constantly growing object that follows the evolution of the application itself and expands in accordance with the collection of new data from different European territories. With each new region that joins the Bee-Sustain network, the book is updated with new content. Considering the rich biodiversity of the European continent, Bee-Sustain has the potential to develop into a comprehensive platform that will include data from different territories, respecting local ecosystems, climatic specificities and native honey plants of each region. By introducing data from different European countries, the application will become a tool for local beekeepers and other users who would help preserve biodiversity with their actions. As a living work of art dedicated to the preservation of ecosystems, the art book Honey Plants – Medonosne biljke encourages active audience participation, contributes to education and encourages reflection on a sustainable future.

Buduća implementacija

Bee-Sustain, aplikacija zasnovana na veštačkoj inteligenciji, nastala je kao odgovor na sve izraženije klimatske promene, ubrzanog tehnološkog razvoja i sve slabije povezanosti čoveka s prirodom. Aplikacija koristi veštačku inteligenciju kako bi pratila podatke sa IoT uređaja i vremenske uslove i odredila optimalne lokacije za postavljanje košnica čime direktno utiče na povećanje prinosa meda i posredno doprinosi većem uspehu u oprašivanju voćarskih i povrtarskih kultura. Prati i stanje samih košnica i analizira mikrolokalitete, pružajući korisnicima detaljne i personalizovane informacije koje im omogućavaju da donesu najbolje odluke. Iako je u početnoj fazi fokusirana na teritoriju Republike Srbije, metodologija i vizija projekta ukazuju na njegovu širu primenu — pre svega na evropskom nivou.

Pored tehnološke sofisticiranosti, *Bee-Sustain* povezuje i različite oblasti: nauku, prirodu i umetnost. Da bi ta veza bila jasna, projektni tim je odlučio da tehnologiju predstavi kroz formu umetničke knjige *Honey Plants – Medonosne biljke* — koja će biti jednako dostupna pčelarima, ali i drugim korisnicima koji u knjizi prepoznaju poziv na učešće. U tom kontekstu, knjiga postaje više od informativnog sredstva — ona je umetničko sredstvo za klimatsku i ekološku pismenost. Kroz poetski i vizuelni jezik, čitaoca podseća na lepotu i složenost prirode, ali i na njegovu odgovornost.

Honey Plants – Medonosne biljke nije klasičan herbarijum, već živa knjiga — stalno rastući objekat koji prati evoluciju same aplikacije i širi se u skladu sa prikupljanjem novih podataka sa različitih evropskih teritorija. Sa svakim novim regionom koji se priključi mreži *Bee-Sustain*, knjiga se dopunjuje novim sadržajima. S obzirom na bogat biodiverzitet evropskog kontinenta, Bee-Sustain ima potencijal da se razvije u sveobuhvatnu platformu koja će obuhvatiti podatke sa različitih teritorija, uvažavajući lokalne ekosisteme, klimatske specifičnosti i autohtone medonosne biljke svake regije. Uvođenjem podataka iz različitih evropskih zemalja, aplikacija će postati alat za lokalne pčelare i za druge korisnike koje bi svojim postupcima pomogli očuvanju biodiverziteta. Kao živo umetničko delo posvećeno očuvanju ekosistema, knjiga *Honey Plants – Medonosne biljke* podstiče aktivno učešće publike, doprinosi edukaciji i ohrabruje na promišljanje o održivoj budućnosti.


AI



Lokacije sa kojih se trenutno prikupljaju podaci

Locations from which data is currently being collected



Lokacije kroz pet godina sa kojih će se prikupljati podaci

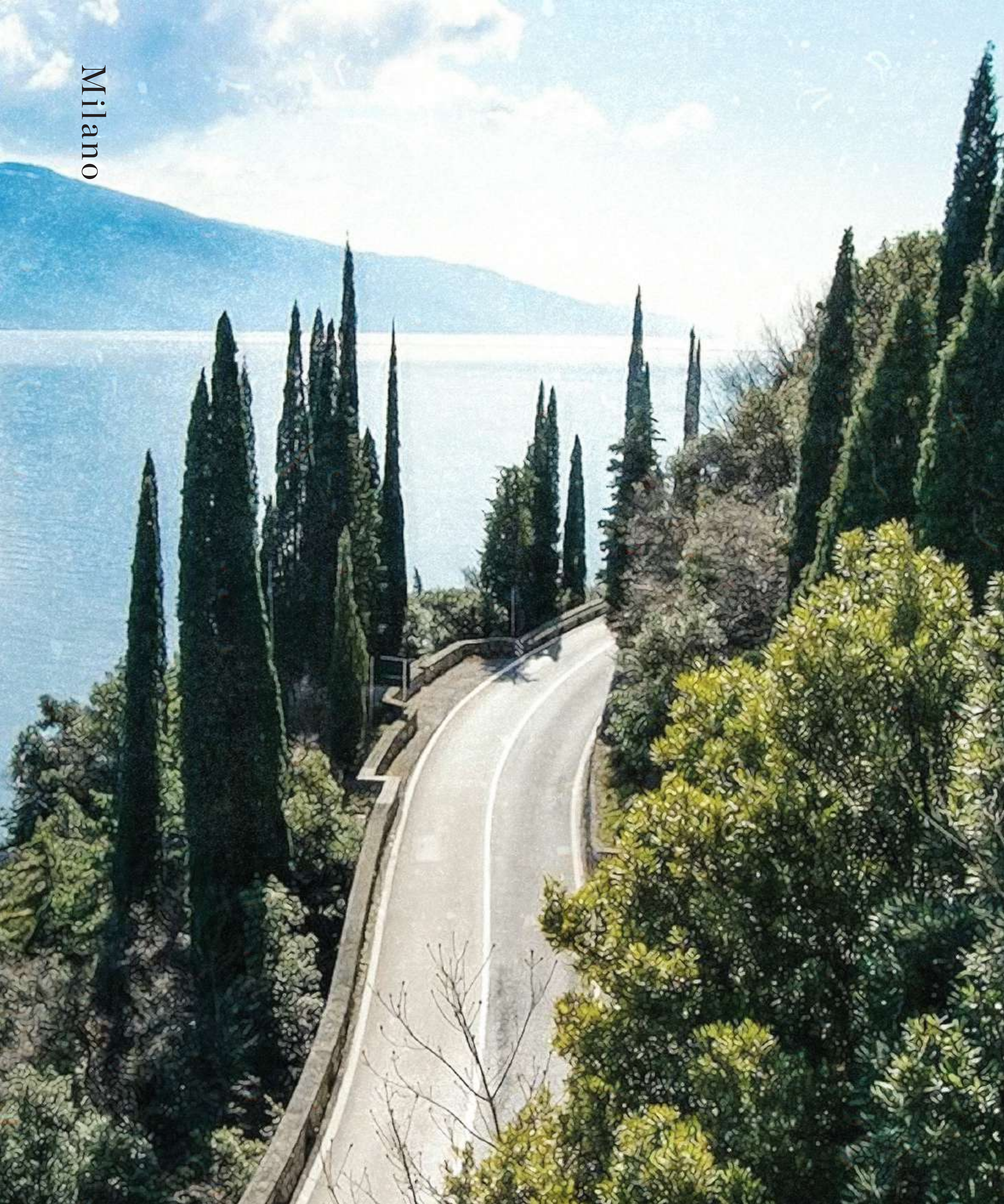
Locations over five years from which data will be collected



Maslina (eng. Oliv)

Maslina je vrsta niskog, zimzelenog drveta. Lostovi su eliptični, duguljasti, kožasti sa tamnozelenim licem i srebrnastosivim naličjem i vrlo kratkom drškom. Grozdaste cvasti čine cvetovi sa belom krunicom. Plod je jestiva koštunica maslinka tamnoplave do skoro crne boje.

The olive tree is a type of low, evergreen tree. The leaves are elliptical, oblong, leathery with a dark green surface and a silvery underside and a very short stalk. The inflorescences are racemose and consist of flowers with a white corolla. The fruit is an edible olive drupe of dark blue to almost black color.


Milano

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